University of Minnesota

Medical Bulletin

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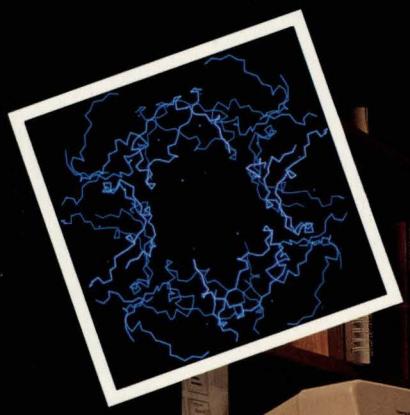

X-ray Crystallography: Molecules in 3-D

Winter 1993

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ON THE COVER:

Dr. Leonard Banaszak, director of the Kahlert Structural Biology Laboratory, displays the magical images of x-ray crystallography.

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The Minnesota Medical Foundation was founded in 1939 by a dedicated group of faculty members and medical alumni who saw the need for private support to build a strong future for the Medical School. A non-profit organization, MMF raises and disburses funds for medical education and research at the University of Minnesota Medical Schools in the Twin Cities and Duluth.

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Staff:
Jean Murray, Editor; Mark Marshall, Alumni Relations Director; David R. Teslow, President and CEO.

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Now Playing in the Kahlert Structural Biology Lab:

MOLECULES IN 3-D!

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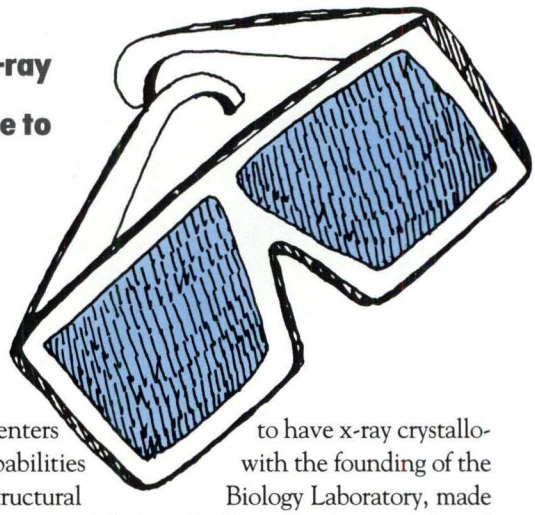


You are sitting in a movie theater watching the featured attraction "It Came From Outer Space" through a pair of cardboard glasses with colored cellophane lenses. As you munch popcorn, a flying saucer seems to leap off the screen and come right toward you. Even though you know it's only an illusion, it looks so real you can't help but duck.

If this could be a scene from your past, you were probably a movie-goer in the early 1950s, when Hollywood briefly added a third dimension to motion pictures. Although 3-D technology made a spectacular debut, it never really caught on, and by the mid-'50s it had vanished into the archives of film history. It remained there until the mid-1960s, when it was recycled for use in x-ray crystallography, a complex scientific process for getting a better look at things that come from inner space.

Today, 3-D technology makes it possible to see a protein molecule on a computer screen, which enables genetic engineers to delete, replace, or add parts to change the molecule's function. That ability is triggering a scientific revolution that could have a profound effect on the choices we have as consumers. Molecules are being altered to create enzymes that make detergents work better, to breed insect-resistant plants, and to design drugs to order. It's no wonder x-ray crystallographers are in demand in both science and industry.

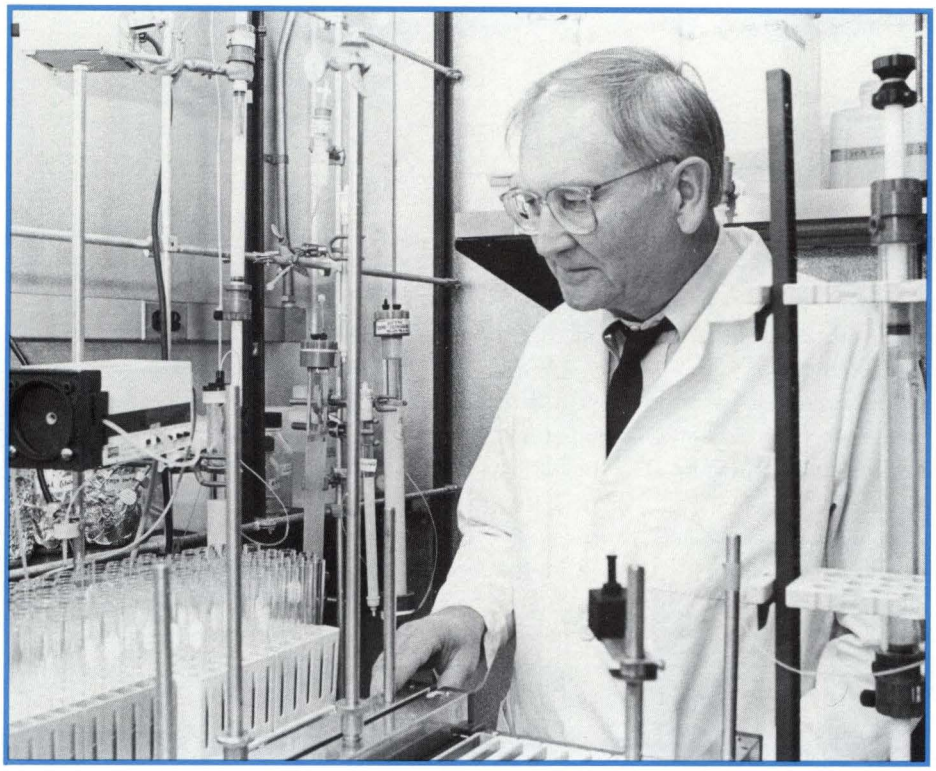
In 1989, the University of Minnesota joined a growing number of research centers to have x-ray crystallography capabilities with the founding of the Kahlert Structural Biology Laboratory, made possible by patron William G. Kahlert, who contributed $1 million for the laboratory, and William F. Dietrich, who contributed $1 million for an endowed chair in molecular biology. Recruitment of Leonard Banaszak as director and chair holder brought a level of expertise equalled at few other universities. Banaszak has been involved in the development of x-ray crystallography for 30 years, and is recognized as a leading authority on the process.

Although x-ray crystallography is only now coming into its own, its history reaches back to the early part of this century, when German researchers proved that directing radiation through a crystal and onto x-ray film produces a diffraction pattern unique to that particular crystal. (Radiation is scattered by the crystal much the same way light is scattered by facets on a diamond.) In the 1930s an English graduate student named Max Perutz applied that process to learn about protein structure. Perutz ended up spending his entire career studying the molecular structure and function of a single protein, hemoglobin. Ultimately he and his associate, John Kendrew, were awarded the 1962 Nobel Prize in chemistry for their work.

Banaszak was a postdoctoral student at the University of Indiana at Bloomington when Perutz began to publish articles about using x-ray

BY PEGGY RINARD

Peggy Rinard is a science writer for the University of Minnesota office of Health Sciences Public Relations. Photos by Nancy Mellgren.



Dr. Leonard Banaszak, director of the Kahlert Structural Biology Laboratory and holder of the William F. Dietrich Chair in Fundamental Molecular/Cell Biology in the Basic Science, works in the lab's "cold room."

crystallography to find the structure of hemoglobin. Like many others in the scientific community, he was doubtful that x-ray crystallography really worked. The favored approach was studying a protein in solution. So he and another postdoctoral student set out to prove Perutz wrong. Instead, he became convinced Perutz was right and got hooked on x-ray crystallography. He applied for and won a fellowship to study with Kendrew, and was soon on his way to Cambridge.

It amuses Banaszak that skepticism about x-ray crystallography persists to this day. He always begins his class on protein structure by asking students how many think the crystal and solution protein structures are the same, and every year he catches at least a few with their hands down. "So every year we spend two or three lectures hashing that out," he says with a smile. "But the bottom line is that nuclear magnetic resonance has now been used to verify the accuracy of crystalline protein structures."

A decade of its own

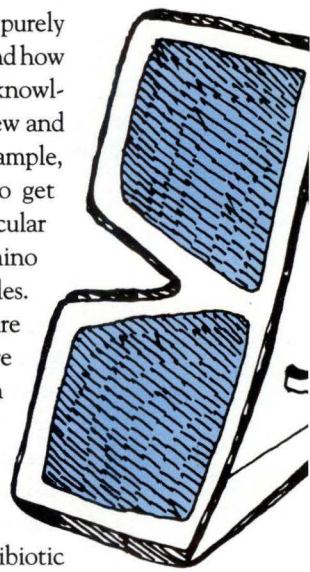
Although x-ray crystallography has been around since the '30s, technology to make it practical didn't exist until much later. When Banaszak began his x-ray crystallography training in the early 1960s, the computer he used was a vacuum-tube model that took up two floors and required a huge staff to operate and maintain. After the silicon chip came along, the wave of progress in computer technology sent x-ray crystallographyshooting ahead. The computer he now uses in the Kahlert laboratory is the size of a 2-dozen box of donuts and does much more work in a fraction of the time.

"To get a single computation, technicians would have to process hundreds of IBM cards," Banaszak remembers. "If we were lucky, we'd get the answer in 24 hours. If one card was incorrectly punched, the project had to be resubmitted. It takes only a few minutes to do the same type of computation on the computer we have now."

Genetic engineering provided x-ray crystallography with another needed boost. Before these techniques were developed, Banaszak isolated proteins for study from slaughterhouse leftovers. It was a tedious process, and it was impossible to get enough of many medically important proteins to use in experiments. Now adequate quantities of any protein can be purified from cloned cells in a few hours.

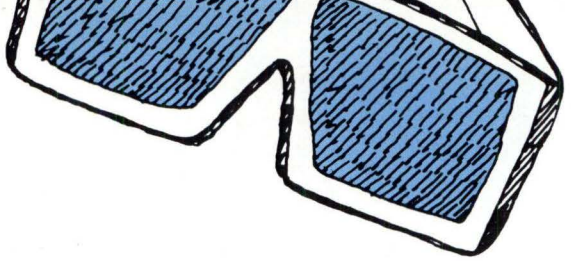
With the '90s, x-ray crystallography came into its own, and is now poised and ready to deliver on its capabilities.

New and improved proteins



For the most part, x-ray crystallography has been a purely scientific quest to learn how proteins are assembled and how they work. Now scientists are beginning to use that knowledge to fix malfunctioning proteins and to create new and improved ones with practical applications. For example, detergent manufacturers have altered enzymes to get clothes cleaner in warmer water. In agriculture, molecular structure is being altered to make foods richer in amino acids and to create insect-resistant fruits and vegetables. Researchers at the National Institutes of Health are looking for a way to treat AIDS based on the structure of proteins critical to the development of the human immunodeficiency virus.

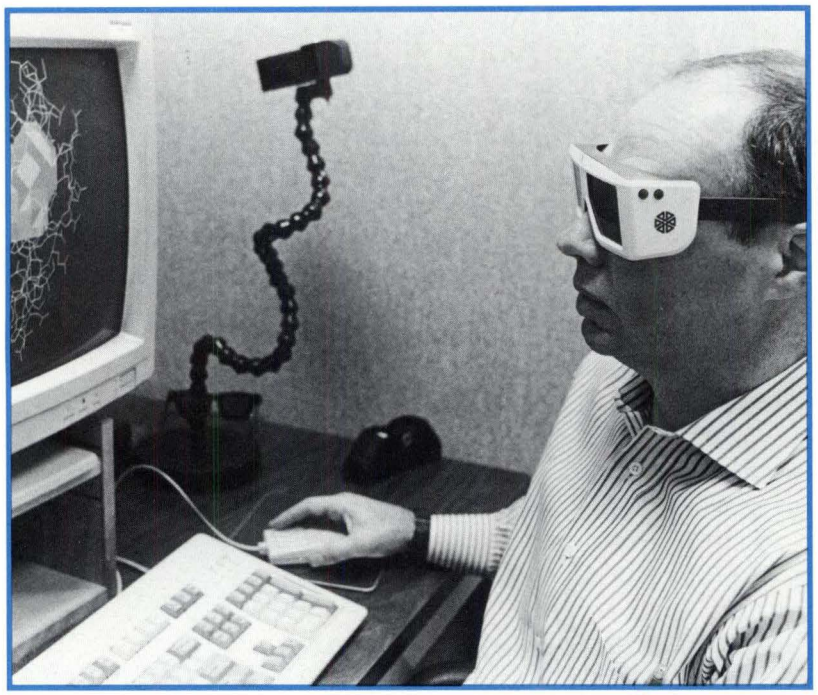
Trial, error, and luck have been the traditional methods of finding a drug that works. Aspirin was one of the first drugs found by trial and error, and its precise mechanism is still being debated. The antibiotic action of penicillin was discovered when mold contaminated a culture of staphylococci bacteria. With the ability



MOLECULES IN 3-D!

to see and even manipulate molecular structure, scientists could soon make drugs to order to fix, eliminate, or disable proteins critical to disease processes. X-ray crystallography is also being applied to understand the mechanism of action of many drugs that have been in use for years.

"The idea of creating drugs based on molecular structure is bringing a new perspective to drug design." Banaszak says. "Over the next three or four decades it could bring about a complete change of approach."



Dr. David Levitt uses the Kahlert lab's new electronic 3-D system that gives a clear, realistic image through use of a sensor.

Pure science

Banaszak is reluctant to discuss clinical applications of his own work, but his studies of the interactions of lipid molecules with proteins could have implications for heart disease.

"I'm always embarrassed to promote that aspect of my work because I can't say that today we're doing this experiment and tomorrow the world will be free of heart disease," he says. "That's just not true. We're simply trying to understand the way these things work at the molecular level."

But Banaszak acknowledges that fatty acid binding protein (FABP), one of the four molecules he is now studying, has clinical potential. FABP is one of a family of binding proteins involved in lipid metabolism. Its job is to enclose the lipids and transport them through the bloodstream. Without binding proteins, lipids are not soluble in blood. Together with Dave Bernlohr, a biochemist on the St. Paul campus, Banaszak is altering the structure of FABP to adapt it for transporting drugs.

"We have the structure of FABP," Banaszak says, "and we've designed some changes in it. Now we're beginning to use genetic engineering to build a little atomic gate on the molecule to open and close it. It may be possible to change the pocket so that it binds compounds other than fatty acids."

He has also learned that FABP is chemically modified by insulin, and believes that chemical connection could be key to the effect of insulin on fat metabolism. He hopes the research may some day reveal a way to regulate lipid metabolism in diabetics, which is known to lead to heart disease.

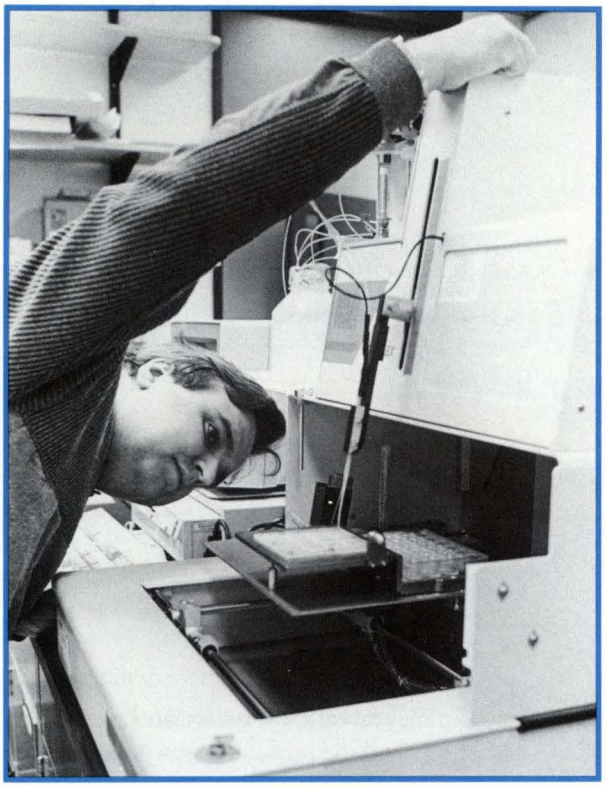
Environmental clean-up

Banaszak's research interests are complemented by those of key faculty members Douglas Ohlendorf, associate professor of biochemistry, and David Levitt, professor of physiology. Ohlendorf, who worked as an x-ray crystallographer for du Pont before he came to the Kahlert lab in the summer of 1991, brings an environmental perspective and an interest in crystallizing proteins. Levitt supplies much of the group's computer wizardry.

Ohlendorf is studying a family of proteins called dioxygenases found in soil bacteria that can break down certain toxic pollutants, rendering them harmless. He's also studying proteins in bacteria that are critical in the conversion of methane — a gas produced by decomposition of organic matter — into methanol, a form of alcohol that can be used as a clean-burning fuel.

"The process is also important in nature because it keeps methane, which is one of the pollutants that cause the greenhouse effect, out of the atmosphere," says Ohlendorf. "Bacteria in the ocean convert the methane into methanol, the methanol into formaldehyde, and the formaldehyde into sugars and amino acids, which enter the general biomass and can be used by organisms."

When Ohlendorf came to the University, he brought with him a robotics system for crystallizing proteins developed by a colleague at du Pont. The system has helped his group crystallize 15 proteins over the past year, which is no small achievement. Crystals usually grow in about one or two weeks, but the conditions under which they will grow are often elusive and idiosyncratic. It can take several months to get just the right combination of temperature, salt concentration, and pH balance, among other variables.



Dr. Doug Ohlendorf's robotics system has helped crystallize 15 proteins in the past year.

The robotic system does a lot of the repetitive work involved in setting up test conditions, which speeds the process up.

The ideal place for crystallizing a protein is in outer space, where its growth isn't restricted by gravity, which sets up convection currents in the liquid that impede crystallization. While at du Pont, Ohlendorf worked with NASA to send several proteins up on space shuttles. He recently submitted a proposal to NASA to send the protein that triggers toxic shock syndrome up on a shuttle. He's collaborating with Pat Schlievert, associate professor of microbiology, who is an expert on toxic shock syndrome.

"We plan to do more collaborative research like this with researchers in the health sciences who are interested in learning the molecular structure of proteins involved in the disease processes they are studying," Ohlendorf says.

Computer wizardry

David Levitt wandered down from the Physiology Department to check out the Kahlert lab when it opened and has been there ever since.

"The thing that appealed to me about x-ray crystallography and still does is that you get something tangible for your work, not just another theory that's going to be refuted in a few months or years," Levitt says. "The protein structure of a molecule, with the atoms all in place, is forever. It's not going to change. You put it into the data bank and someone can use it right away."

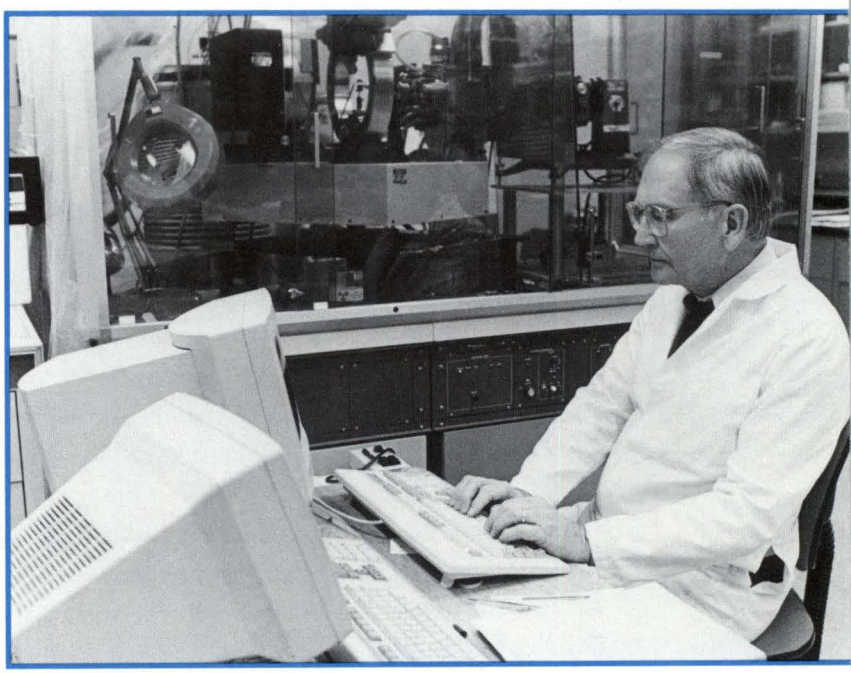
Although Levitt came to the Kahlert lab with no training in x-ray crystallography, his affinity for math and computers quickly made him an asset to the research team. He's now putting the finishing touches on a program that simplifies computer modeling of a protein structure and cuts the amount of time it takes to get through the first phase from a year to only a few weeks. It's one of the first programs of its kind. He hopes to further streamline the process.

"As computers become more powerful, we'll be able to take advantage of developments in artificial intelligence that allow the computer to take over some of the decision making so the investigator will become less and less involved with the actual computations," he says.

Journey to the Center of a Molecule?

The Kahlert lab recently acquired a new electronic 3-D system that gives a clearer, more realistic image by using a sensor to relay signals back and forth from the computer to the lenses in special video glasses worn by the viewer. The interactive nature of the new system draws on virtual reality, an innovation in computer technology that gives the user the illusion of moving through a three-dimensional, computer-generated world.

Virtual reality is being used by architects to tour buildings that haven't been built, to simulate a trip through outer

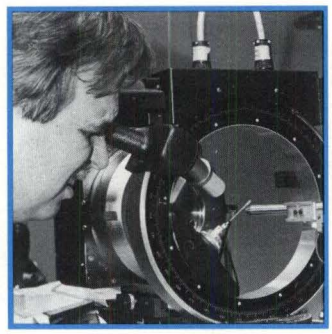


Progress in computer technology in recent years has rapidly accelerated the advancement of x-ray crystallography.

MOLECULES IN 3-D!

X-ray crystallography: A how-to primer

So, you think you want to be an x-ray crystallographer? You're not alone. Leonard Banaszak used to have trouble recruiting graduate students to work in his lab, but over the past few years the field has become so popular he can't keep them out. Be prepared to put your brains on the line. Just to get started, you need to have a background in both biochemistry and physics. Candidates who flinch at the sight of algorithms need not apply.



Determining the structure of a protein by x-ray crystallography is a multi-step process. First, a batch of cells containing the desired protein is grown in a small laboratory appliance called a computer-controlled fermenter, then the protein is biochemically separated from as many as 2,000 others in the cell. The purified protein is mixed with a precipitating salt and left to crystallize.

Getting good crystals is tricky because temperature, the type of salt used, the pH balance, the purity of the protein, and other factors all affect the results. It takes patience, care, and an eye for noticing signs that crystals are ready to appear. However, by using the robotic system to do the tedious work, most proteins can be crystallized. The most perfect and largest crystals have been cultivated in space, where the absence of gravity allows them to thrive.

A sealed glass tube containing crystallized protein is mounted on a machine called a diffractometer and radiation is directed through it onto a radiation detector. The diffractometer is programmed to slowly rotate the tube so it is exposed to x-rays from about a thousand different orientations. Diffraction from atoms in the crystal show up as a shower of dots on the detector. The detector translates the diffraction patterns into digital information that is transmitted to computer files every two minutes.

The toughest and longest part of the process lies ahead in the computer room, where a researcher may spend as long as two to three years working with the data provided by x-ray diffraction to get a clear picture of the protein's atomic structure. Essentially, the scientist and computer together act as a lens to bring the fuzzy image provided by the x-ray detector into focus. It's kind of like a playing a master's version of connect the dots. The x-ray crystallographer takes the digitized diffraction patterns and uses complex mathematical manipulations to 'focus' them and pinpoint the location of the electrons. Since every atom has electrons, knowing where the electrons are clues him or her in to the location of atoms. The amino acid sequence of the protein is used as a guide. With the dots (atoms) connected, the structure is revealed. Colors are assigned to components of the protein to distinguish them from each other.

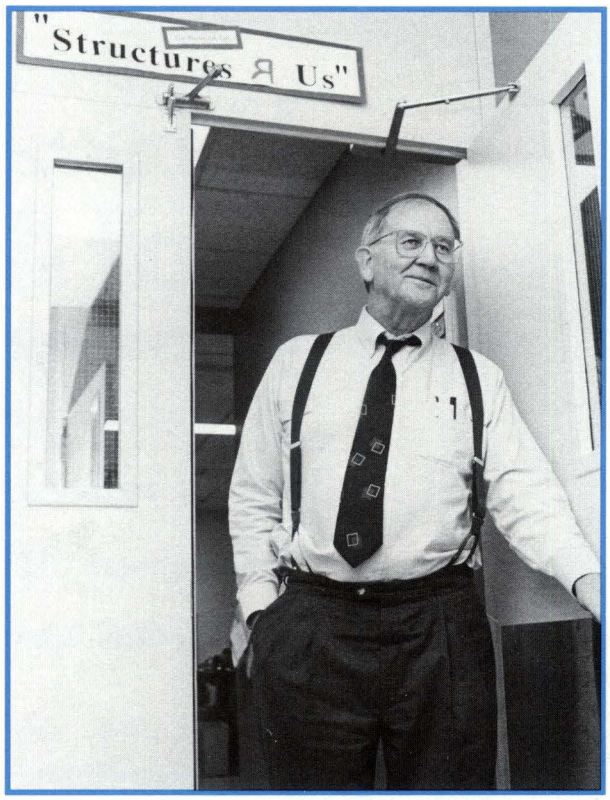
When a protein structure is finished at the Kahlert laboratory, it is sent on to an international library that is accessible by computer to scientists throughout the world. There are about 700 molecules in the library now. Those could be grouped into about 50 families, Banaszak says. Once a structure is known it's logical to go on to proteins within the same family to study their differences, which are often slight. Banaszak and Ohlendorf have contributed many protein structures to the data bank and often access the library for their own studies. ■

space in the "Star Tours" ride at Disney World, and may soon by used by automobile manufacturers to test automobile safety through simulated crashes. Perhaps the next technological step x-ray crystallography takes will be right into a protein molecule.

"We're keeping abreast of virtual reality technology to be in a better position to adapt it for our own purposes," Doug Ohlendorf says. "It seems to be the way science is going, and it will probably be the direction we'll take over the next ten years. Creating a symbiosis between the computer and the scientist is a very attractive idea. In our case, it could allow us to take a walk through a molecule.

"To view a molecule now," he explains, "you must continually turn dials or type in commands and wait for a response. With virtual reality, body movements automatically move the molecule. Step forward and you move into the molecule. Turn your head and the molecule rotates. Virtual reality will make it easier for the computer to tell the researcher what the structure is."

Watch for coming attractions in the Kahlert Structural Biology lab. ■



Donors' generosity makes research possible

The research now in progress at the Kahlert Structural Biology Laboratory was made possible by generous contributions to the Minnesota Medical Foundation (MMF) from two very special people.

In 1985, William F. Dietrich donated $1 million to MMF to establish the William F. Dietrich Chair in Fundamental Molecular/Cell Biology. Two years later, William G. Kahlert contributed $1 million to MMF to establish the x-ray crystallography laboratory.

Born in 1901 in Minneapolis, Dietrich was a business leader, philanthropist, and advisor to fledgling companies. He became president and CEO of Green Giant Company in 1950, and after retiring founded Community Investment Enterprises, which later became FBS Venture Capital. His firm was instrumental in helping a number of high-technology companies, including Medtronic Inc., Polaris Industries, Kroy Inc., Immuno Nuclear Corporation, and many others. William Dietrich spent a lifetime sharing his time, knowledge, and resources with others. He died in April of 1990.

William Kahlert was born in 1891, and remembers unpaved streets and horse-drawn vehicles in St. Paul. He attended the University of Minnesota, majoring in economics, and had a successful career as a stockbroker specializing in railroad bonds. Kahlert's young wife, daughter, and several relatives died of cancer, and as a result, he was motivated to support research at the University of Minnesota. On December 24, 1992, William Kahlert will celebrate his 101st birthday. ■

Researchers of Merit

Two University of Minnesota Medical School faculty members receive the prestigious NIH MERIT award, bringing the Medical School total to fourteen.

Two distinguished University of Minnesota Medical School researchers have recently been awarded the prestigious MERIT award from the National Institutes of Health (NIH).

Drs. Gordon D. Ginder and Alfred F. Michael join 12 previous winners: Khalil Ahmed, Ph.D., professor, laboratory medicine and pathology; Robert J. Bache, M.D., professor, medicine; Marilyn Carroll-Santi, Ph.D., associate professor, psychiatry; Robert P. Elde, Ph.D., Johnston Land Grant Chair of Neuroscience professor, cell biology and neuroanatomy; Leo T. Furcht, M.D., Allen-Pardee professor and head, laboratory medicine and pathology; Ashley T. Haase, M.D., professor and head, microbiology; Harry S. Jacob, M.D., professor, medicine; Horace H. Loh, Ph.D., Stark professor and head, phamacology; Danuta Malejka-Giganti, Ph.D., associate professor, laboratory medicine and pathology; Robert F. Miller, M.D., 3M Cross professor and head, physiology; Chang Won Song, Ph.D., professor, therapeutic radiology-radiation oncology; and James G. White, M.D., regents' professor, pediatrics and laboratory medicine and pathology.

Beginning in 1986, NIH began offering a limited number of MERIT (Method to Extend Research in Time) awards to investigators who had demonstrated superior competence and outstanding productivity during their previous research endeavors.

The purpose of these awards is to provide long-term stable support to those whose research performances have been distinctly superior. Long-term support fosters continued creativity and spares these researchers the administrative burdens associated with preparation and submission of research grant applications.

Investigators do not apply for MERIT awards. After submitting research proposals in accordance with conventional NIH procedures, candidates are singled out for MERIT award consideration by NIH staff or members of the National Advisory Council.

Criteria for selection include: a regular research project grant application that is deemed highly meritorious by the initial review group; a past record of scientific achievement and demonstrated leadership in the research area addressed by the grant application; and an area of research of recognized importance or of special promise.

MERIT awards are granted for an initial period of three to five years. Based on review of accomplishment, the award may be extended for an additional three to five years.

BY JEAN MURRAY

Photos by Nancy Mellgren

Gordon D. Ginder, M.D.

Dr. Ginder, director of medical oncology and professor in the Institute of Human Genetics at the Medical School, received a MERIT award for his research project entitled, "Regulation of globin gene expression during erythroid differentiation."

The research program is concerned with molecular factors that control gene expression during differentiation of cells in the bone marrow into red blood cells, also known as erythroid cells. In these studies, Ginder and his coworkers have determined some of the factors in the nucleus of bone marrow cells that determine what type of cell will eventually be produced.

In one specific aspect of this research program,

Ginder and his colleagues have found that a naturally occurring fatty acid, butyric acid, is capable of stimulating expression of specific genes in specific bone marrow cells.

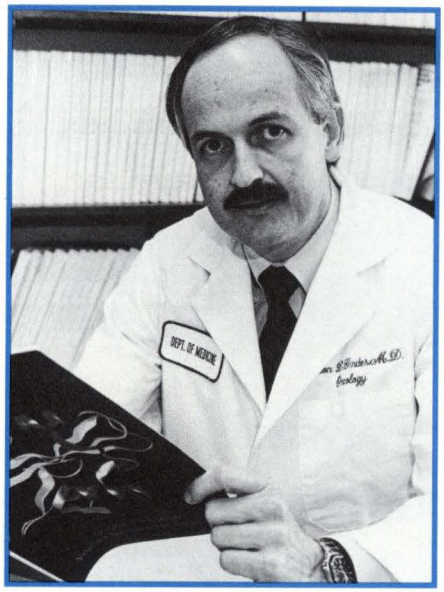
In medical terms, these studies relate to two major classes of diseases. The first is a group of inherited diseases of red blood cells, including sickle cell anemia and thalassemia. These diseases are severe and often fatal inherited disorders which affect hundreds of thousands of people worldwide.

As a result of the basic research work done in this area of Ginder's laboratory over the last several years, a new potential treatment for these diseases is now undergoing evaluation through testing of a new class of drugs in patients with sickle cell anemia and thalessemia.

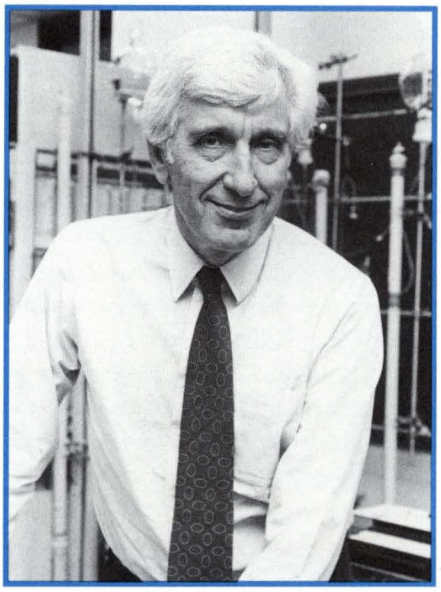
The other application of the research in Ginder's laboratory supported by the NIH MERIT award is in the understanding and manipulation of cell differentiation and cell growth as it relates to cancer. Butyric acid and related compounds have also been shown to have significant effects in causing the differentiation of cultured tumor cells. These compounds may offer an alternative way to control the growth of malignant cells.

Ginder has been at the University of Minnesota since 1990. He received his M.D. from The Johns Hopkins University School of Medicine, and before coming to Minnesota was professor of medicine and associate director, Division of Hematology/Oncology, at the University of Iowa.

His areas of research interest include: gene regulation during normal and abnormal cell differentiation, control of DNA methylation in eukaryotic cells, regulation of HLA Class I gene expression in normal and malignant cells, and allogeneic and autologous bone marrow transplantation.



Dr. Gordon D. Ginder



Dr. Alfred F. Michael

Alfred F. Michael, M.D.

Dr. Michael, regents' professor and head of the Department of Pediatrics, received a MERIT award for the study of renal diseases in childhood. The research is directed at understanding the causes of serious kidney diseases that affect children.

Michael says, "The kidney is a unique organ — the master chemist of the body — that maintains acid-base balance, rids the body of breakdown products, controls water and salt balance, and has a host of other functions. Each kidney contains about 1 million filtering units, called glomeruli, which are made up of unique cells and a substance between the cells called basement membranes. Injury to these structures is a common feature of the various forms of glomerulonephritis, hereditary renal diseases, diabetic nephropathy, and nephrotic syndrome."

The planned studies will define the biologic role of certain new collagen proteins that make up these basement membranes and characterize the changes seen in disease and during fetal development. A number of different techniques will be used including molecular analysis, protein chemistry, immunologic methods, and patient studies.

Colleagues in the study include Drs. Mary Kleppel, Clifford Kashtan, Ralph Butkowski, Youngki Kim, and Alfred Fish.

Michael received his M.D. degree from Temple University School of Medicine in Philadelphia. He has been chairman of the Department of Pediatrics at the University of Minnesota since 1987, and is also chief of pediatrics at the Variety Club Children's Hospital, University of Minnesota.

Michael serves on the council of the American Society of Pediatric Nephrology, is on the council and president-elect of the American Society of Nephrology, is on the board of the National Disease Research Interchange and the National Association of Children's Hospitals and Related Institutions, on the executive committee of the Association of Medical School Pediatric Department Chairmen, Inc., and has been an integral part of the Viking Children's Fund since its inception. ■

A Plan for Minnesota

University faculty members play a key role in health care reform plan.

Health care reform — most everyone agrees we need it, but many disagree on the means of achieving it.

Federal legislators have discussed reforms in the health care delivery system for years, but have never come close to reaching any kind of consensus. As those discussions continue on a national level, states have become more active in developing their own initiatives for improving access to health care, controlling costs, and reforming insurance underwriting.

In April, the state of Minnesota became the fourth state to establish its own system for health care delivery. HealthRight, an innovative health-care plan that will provide health insurance to more than 150,000 uninsured Minnesotans and offer the hope of controlling medical costs for those who already have insurance, was signed into law on April 16, 1992. (The name was later changed to MinnesotaCare.)

Many groups, including insurance companies, hospitals, and physician groups, opposed the measure, while others championed the cause. Primary supporters of the plan included organized labor, the Children's Defense Fund, the nurses' associations, public physicians (particularly pediatricians), senior citizen groups, the Minnesota Chapter of the National Organization of Women, and a small group of doctors from the University of Minnesota Medical School.

The call for action

In 1989 the Minnesota State Legislature created the Health Care Access Commission to develop a proposal for making health care more affordable and accessible for residents. The plan was to provide health coverage for uninsured Minnesotans for $150 million or less per year.

The Commission began its task by holding public hearings and listening to the testimony of health experts. It also commissioned two research projects to gather data — one study investigated employer-provided health benefits and the other profiled uninsured and underinsured Minnesotans.

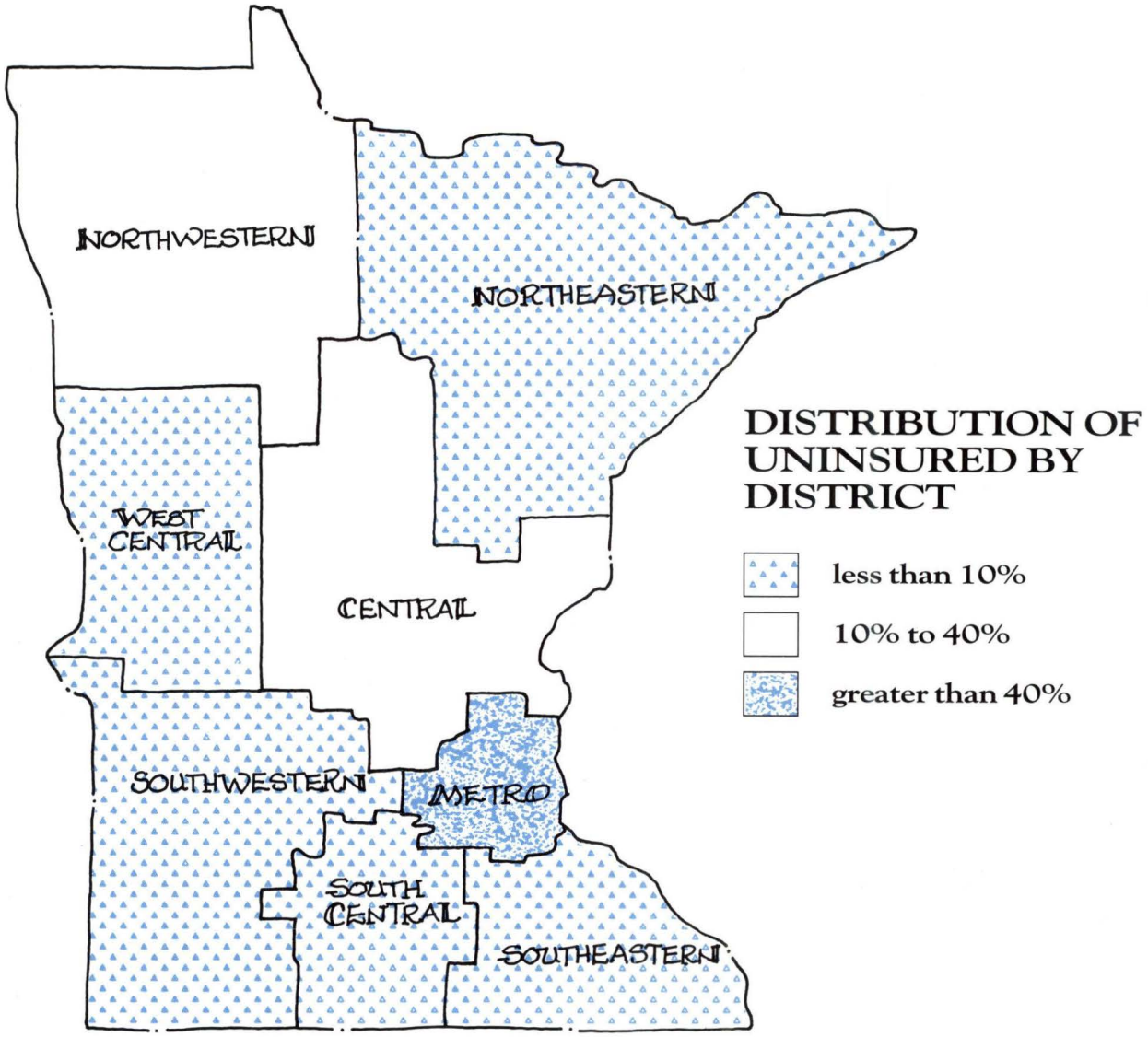
Principal investigators on the second study included University of Minnesota Medical School faculty Dr. Nicole Lurie, associate professor of medicine and public health, and two members of the School of Public Health faculty, Drs. Bryan David and Michael Finch. Their research data was the base for the recommendations the Commission proposed for a universal health care access plan for Minnesotans which eventually became MinnesotaCare.

Two other faculty members actively involved in the process were Dr. Steven Miles, associate professor of medicine, who served as a member of the Commission, and Dr. Charles Oberg, clinical assistant professor of pediatrics, who was an alternate member. Dr. Scott Giebink, professor of pediatrics, was also a strong supporter of the plan.

The investigation

Drs. Lurie, David, and Finch began their research through telephone interviews with a random sampling of Minnesota residents. Respondents were categorized into several categories — those with group insurance purchased through a place of employment or union; those with individual insurance purchased directly by the individual; those with Medicare, Medicaid, General Assistance, Children's Health

BY ELAINE CUNNINGHAM



Plan, or other government insurance plans; those who qualified for veteran's coverage; those who were uninsured; and those who were uninsured intermittently during the past year.

Data on employment status, household income, access to health care, expenditures, and other sociodemographic characteristics were also obtained from the interviews. Those with insurance were asked about premiums, deductibles, co-payments, and extent of coverage. All respondents were asked to rate their current state of health as excellent, good, fair, or poor.

The results

A total of 11,946 households were contacted. Approximately 4.5 percent of Minnesota's population was uninsured for the entire year, 8.6 percent was uninsured for at least one month during the past year, 56.6 percent had group insurance, 26.5 percent had government insurance, and 8.5 percent had individually purchased insurance. The majority of those uninsured or intermittently insured cited the high cost of insurance as their reason for not obtaining health insurance, and job loss was a major factor for those who were intermittently insured.

The uninsured differed from those with group insurance in that they were younger, more likely to be male, non-white, and to have lower incomes. More than 27 percent were below the federal poverty limit. Slightly more than half of the uninsured lived in rural areas. The uninsured also had worse health status then those with group insurance — fewer were in excellent or good health and more had chronic health conditions.

The uninsured also had less access to health care than those with individual or group insurance. Only 56 percent of the uninsured reported a regular source of care as compared to 80 percent of those with group insurance.

Twenty-eight percent of the uninsured said they had delayed obtaining health care services when they felt they had needed it and four percent reported having actually been denied care in the past 12 months because of their uninsured status.

In analyzing insurance coverage for the various groups of

insured respondents, the investigators found that individual policies generally cost more and cover less than group policies. Also, higher income was associated with lower out-of-pocket expenses for those who had group insurance but not for those individually insured.

Using this data, the investigators estimated the extent of underinsurance among the individually-insured group, first by applying the Congressional Budget Office definition of out-of-pocket expenditures in excess of 10 percent of gross income, and second, by looking at the proportion of the group with chronic health conditions who were lacking inpatient or outpatient coverage. Judged on the first criteria, 35 percent of the individually insured group were underinsured and by the second criteria, 24 percent were underinsured.

The recommendations

The data Lurie et. al. compiled was used by the Health Care Access Commission to guide their recommendations that a new state program be established to provide health coverage to the uninsured, underinsured, and small employers. The major recommendations were:

- All Minnesota residents would be required to have health insurance through the new state program, an employee benefits program, or other insurance.

- Individual premium subsidies, based on a sliding income scale, would be available through the new state plan to allow low-income families to afford coverage.

- All uninsured state residents would be eligible for the new plan as would employers who might want to enroll their employees.

- Under the new plan, benefits would include preventive, primary, outpatient, and limited inpatient care. Certain limits would apply to some types of care to maintain an affordable premium.

The net cost of the program ultimately recommended to the state legislature was $144 million to provide coverage to the uninsured and $284 million when subsidies to help the individually insured were added.

The Commission also made the following recommendations:

- that the new state plan deliver health care through contracts with managed-care programs that met strict state specifications to control costs;

- that insurance companies end the practice of denying coverage or making exclusions based on health status and preexisting conditions, and that insurance companies use a "community rating" system for premiums so that the same rates apply to all individuals and small groups;

- that the state provide technical and financial assistance to help those in rural Minnesota plan and coordinate health service and recruit health care personnel.

MinnesotaCare

A somewhat altered version of the recommendations of the Health Care Access Commission was finalized into a bill that quickly passed through the legislature only to be vetoed by the Governor. While legislative leaders and advocates for the bill began developing a campaign to override the veto, the Governor directed his staff to develop their own health care access plan. Shortly before the beginning of the 1992 legislative session, a bipartisan committee began negotiations to finalize a draft of the bill that both parties could embrace. The result was MinnesotaCare.

MinnesotaCare is a vastly altered version of the original recommendations, but it is still an innovative step in providing health care for the uninsured.

MinnesotaCare is a vastly altered version of the original recommendations offered by the Health Care Access Commission, but it is still an innovative step in providing health care for the uninsured and in reforming the insurance and medical bureaucracy.

It is expected that by 1997 MinnesotaCare will raise $254 million and have an enrollment of 158,000 people. Its primary goals are to insure the uninsured, control health care costs, reform insurance practices, and improve access to rural health care. Its funding will come from a five-cent-a-pack cigarette tax (through 1994), a 2 percent surcharge on hospital procedures and procedures performed by doctors, dentists and other providers, and a 1 percent premium tax on HMOs and nonprofit insurers.

MinnesotaCare coverage began for some on October 1, 1992. Over the next four years, eligibility standards will be relaxed, medical coverage will be broadened, and new taxes will take effect to expand the program.

Low-income families earning up to $17,004 annually for a family of two, $25,812 for a family of four, and $34,608 for a family of six will be the first to be covered. Monthly premiums will be based on income and some co-payments will apply. Besides income, to be eligible enrollees must have been without insurance for at least four months and without employer-sponsored insurance for at least 18 months. On January 1, 1993, income guidelines will change, making more people eligible.

In addition to offering insurance to low-income, uninsured Minnesotans, MinnesotaCare is intended to make it easier for small employers to provide health insurance by requiring insurance companies and health maintenance organizations to offer less expensive health care plans and by enabling employers to pool employees for better rates.

The new plan will also prohibit discriminatory underwriting practices that result in higher rates for women and for those whose families have a history of medical problems. There are also cost-containment measures intended to reduce the rate of growth in medical costs by 10 percent in each of the next five years. The cost controls will come from state commissions to be appointed by the governor.

It may be a long time before everyone agrees on the best way to deliver health care, but most people believe that Minnesota has taken a step in the right direction. ■

Role of the Medical School

MinnesotaCare allows funding for the University of Minnesota Medical School to look at ways to enhance the number of students selecting primary care specialties and working in rural Minnesota. The plan requests the regents of the University of Minnesota, through the Medical School, to implement initiatives to increase the number of graduates of residency programs who practice primary care by 20 percent over an eight-year period.

Legislative requests of the Medical School include:

- Requests a study of student demographic characteristics associated with a primary care career choice, and requests the Medical School to modify its selection process based on results of this study.

- Requests modification of the curriculum to give students an early exposure to primary care physicians and primary care practice.

- Requests development of a program to provide students with clinical experiences in primary care settings in internal medicine and pediatrics with training experiences in rural medical clinics and community clinics and HMOs in the Twin Cities.

- Requests increased opportunities for general medicine, pediatrics, and family practice residents to serve rotations in primary care settings, including community clinics, HMOs, and rural practices.

- Provides funds for an expanded loan forgiveness program for practitioners who elect to practice in underserved areas of the state and allows application by eight medical students and eight first-, second-, and third-year residents each year in the primary care disciplines. Students' loans will be reimbursed at the rate of $10,000/year for a maximum of four years served in designated state areas.

- Establishes a rural residency training program in family practice.

- Requests development of continuing medical education programs for primary care physicians that are comprehensive, community-based, and accessible.

- Provides matching funds for non-governmental funds acquired to initiate and sustain these activities.

Fiscal 1993 funding under MinnesotaCare to support primary care training includes $1,062,894 to the Department of Pediatrics, $269,656 to the Department of Medicine, and $409,877 for rural family practice training. ■

A Strong Foundation:

MMF's Fifty-Fourth Annual Meeting

The Minnesota Medical Foundation (MMF) recently celebrated 54 years of support of research and education at the University of Minnesota Medical Schools. The Radisson Metrodome U of M Hotel was the site of the October 28 meeting, which featured ***Dr. Joseph Perpich*** as speaker (see accompanying article). Dr. Perpich is a vice president of Howard Hughes Medical Institute.

Events on the program included reports by MMF Chairman ***James W. Reagan*** and MMF President ***David R. Teslow***, academic awards presentations by Dean ***David M. Brown*** and Dean ***Ronald D. Franks***, donor and volunteer recognition, and introduction of new board members and special guests.

Distinguished Teaching Awards were announced for ***Drs. Linda Van Etta***, ***Arthur Aufderheide***, and ***Omelan Lukasewycz*** of the UMD School of Medicine, and for ***Drs. Timothy Ebner***, ***Mitchell Einzig***, ***Edison McDaniels***, ***Mary McLaurin***, ***Dat Nguyen***, ***Timothy Sielaff***, and ***Valerie Ulstad*** of the Twin Cities Medical School.

Dr. Dennis Livingston was introduced as recipient of the 1992 Outstanding Medical School Teacher of the Year Award, and ***Dr. Peter Gehlbach*** was recognized as recipient of the J. Jacob Kaplan Research Award.

Seven individuals were confirmed as new members of the MMF board of trustees. The board is comprised of faculty of the University of Minnesota Medical Schools, leaders in the medical community, and representatives of the

Award winners from the top:
Outstanding Teacher of the Year Dr. Dennis Livingston, Distinguished Teaching Award winner Dr. Valerie Ulstad, Kaplan Award winner Dr. Peter Gehlbach

corporate community. The board is charged with the overall guidance of MMF in accomplishing its mission of raising and disbursing funds for medical education and research at the University of Minnesota Medical Schools in the Twin Cities and Duluth.

Donald E. DeRauf, M.D., Mendota Heights, internal medicine physician, is a 1948 alumnus of the University of Minnesota Medical School.

Daniel W. Gaither, M.D., St. Paul, is an orthopaedic surgeon at St. Paul Ramsey Medical Center.

Robert L. Lumpkins, Minneapolis, is Chief Financial Officer at Cargill, Inc.

Bert O. Lund, St. Paul, is retired vice president of publishing for The Webb Company.

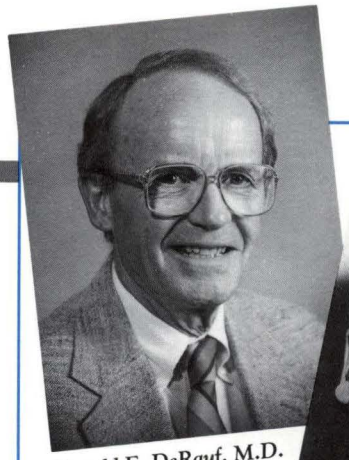
David L. Mona, Edina, is CEO of Mona, Meyer, McGrath & Gavin, Bloomington public relations firm.

Robert D. Sparboe, Litchfield, is president and CEO of Sparboe Companies (egg and dairy product sales, nutrition consulting, banking, and insurance).

Daniel Titcomb, St. Paul, is president of Titcomb & Associates, a business involved in start-up financing.

New ex-officio board members are ***Dr. Robert B. Howe***, associate dean of the Medical School, and ***Dr. Richard K. Simmons***, president of the Medical Alumni Society.

Retiring from the MMF board of trustees are ***Anthony Bechik, Clayton Kaufman, Lauris Krenik, Frederick M. Owens, Jr., M.D.,*** and ***Raymond W. Scallen, M.D.*** ■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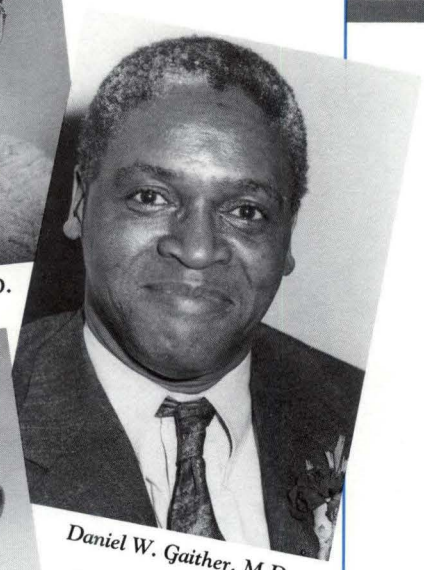
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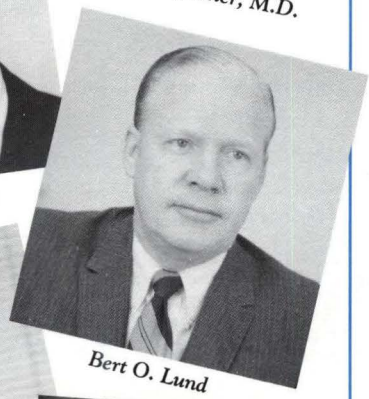
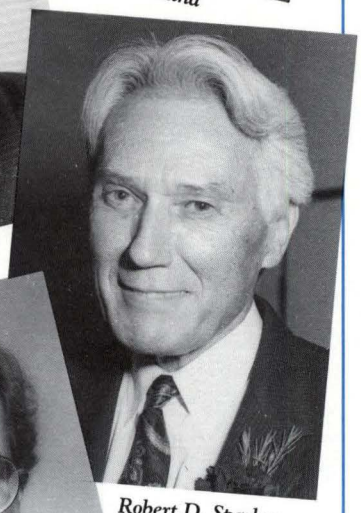

Bert O. Lund


David L. Mona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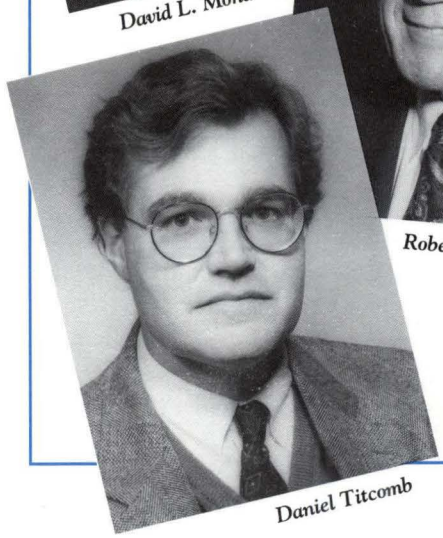

Daniel Titcomb

From DNA to Dr. Seuss:

Turning Students on to Science for the 21st Century

by Dr. Joseph Perpich

Lewis Thomas has written that we are witnessing the greatest revolution in biology and medicine in history. This revolution gained special force with the discovery of the double-helix structure for DNA in 1953 by Jim Watson and Francis Crick. About 25 years later, Jim Watson helped launch the so-called human genome project to define the alphabetical order of the three billion DNA bases in the human chromosome. Ultimately thousands and thousands of pages in print will describe our genetic heritage — and destiny. The steps in the spiral staircase from the DNA molecule to the human genome are slowly but surely being put in place.

Dr. Joseph Perpich

In 1953, Howard Hughes, noted industrialist, aviator, and movie producer, created the Institute that bears his name and made it the sole owner of the Hughes Aircraft Company. After his death, the sale of Hughes Aircraft to General Motors and subsequent investments produced the almost $7 billion endowment that the Institute uses to conduct its programs. It is the world's largest philanthropy.

The Institute operates as a medical research organization, employing approximately 225 scientists and maintaining laboratories at 53 medical schools, universities, and research centers throughout the United States. The Institute's investigators conduct research in five broad areas, including cell biology and regulation, genetics, immunology, neuroscience, and structural biology. The investigators hold faculty appointments at their universities and are given renewal appointments for up to seven years.

The Institute's total budget as of September 1 provides $212 million for research. In this context it is important to point out that support for biomedical research and education from all of the private sector rests on the foundation of support from the National Institutes of Health (NIH). NIH is the largest single national supporter of health research and development with a current budget of $10.4 billion or about 73 percent of all federally supported health R&D.

The University of Minnesota obtains significant amounts of funding from the federal government. The University of Minnesota, for example, is listed 14th among the top 100 institutions ranked according to the amount of federal R&D funding received. The impact of the University of Minnesota research is shown by this institution being ranked among the top 40 institutions in frequency of publications cited.

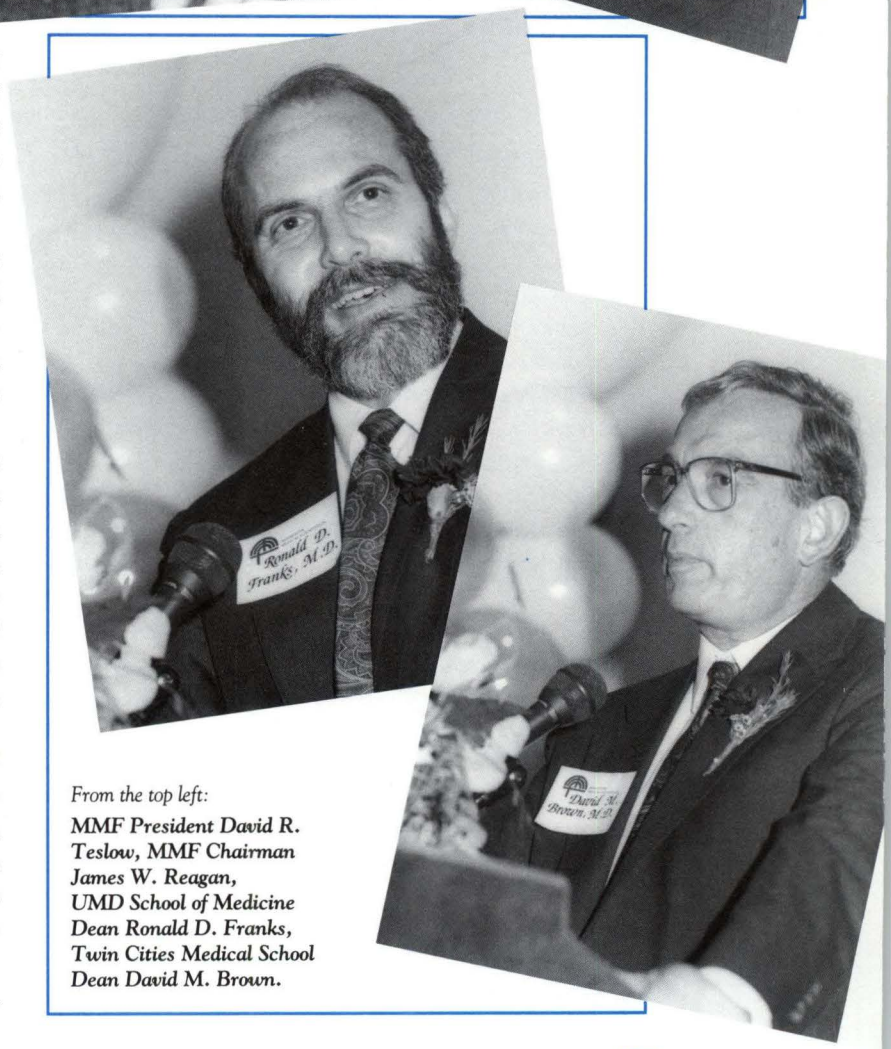
Through my work at the Institute I am witnessing the remarkable advances being made in biomedical research since the days of my medical school training in the 1960s. I think often of the faculty who taught me and the scientists with whom I worked. These faculty helped foster the revolution in molecular biology and DNA that we see today in biology and medicine, and their successors continue to enlarge these research frontiers.

But revolutions — science or otherwise — can't take place in a vacuum. The Institute is convinced that we must make a major commitment to science education to help train the next generation of scientists. The Institute, like the Minnesota Medical Foundation, is committed to future generations of physician-scientists.

◆ Grants and Special Programs

So-called pipeline studies show that out of a pool of four million high school sophomores, more than three million express no interest in science and engineering and are lost immediately. For the remaining 730,000 students who do show some interest, about half are lost between the transition from high school to college.

About 60 percent of the students in this small pool graduate from college still interested in science and engineering and about one-third of these students enter graduate school. One major objective of the Institute's



From the top left:
MMF President David R. Teslow, MMF Chairman James W. Reagan, UMD School of Medicine Dean Ronald D. Franks, Twin Cities Medical School Dean David M. Brown.

grants program is to capture and retain a larger proportion of all students for graduate studies in science and engineering and for medical school.

The Institute's Predoctoral Fellowship Program is open to foreign nationals as well as U.S. citizens and nationals. These fellowships support full-time study for up to five years for a Ph.D. degree in selected fields of the biological sciences. In this international competition we select 65 to 70 students from a total of 1,600 applicants. The Institute now supports 294 predoctoral fellows.

The Institute presently supports three predoctoral fellows at the University of Minnesota. Jennifer Wahlsten is working for her Ph.D. on the molecular mechanisms that lead the immune system to malfunction and attack the body's tissues, such as the destruction of thyroid tissue as seen in Grave's disease. Amy Teel as part of her doctoral program is studying how cells regulate the transfer of information from a cancer gene. Leslie Sprunger's thesis focuses on how genes regulate the production of proteins involved as gatekeepers in the transport of material through the cell's membrane.

We are beginning to see the results of Institute support for superb graduate students like these. Our pre-doctoral fellows have participated in regional, national, and international scientific meetings and have published articles in major scientific journals. They demonstrate enormous promise for future careers in research and teaching.

One year after starting the predoctoral program we began the research training program for medical students in 1988. The pool of potential physician-scientists is drawn from current medical school students, whose interest in research is considerable. The Institute's fellowship program for medical students is intended to provide fellowships for up to 60 medical students annually with an opportunity to spend one year doing intensive research in any academic or research institution in this country.

Some outstanding fellows are selected to receive continued fellowship support for up to two years while completing their medical studies. The program is modelled on the Research Scholars Program jointly sponsored by the Institute and NIH, which brings selected medical students to the NIH intramural laboratories for a year of fundamental research experience.

To date the Institute has supported five medical

student fellows at the University of Minnesota. Three are currently receiving Institute support. John Lee is working on the cellular function of a new class of proteins, known as tektins, which appear to be important in maintaining cell structure. Ronell Hansen is helping develop new computer imaging techniques to replace current invasive cardiac procedures for diagnosing disturbances in heart rhythms. Christine Seroogy has been studying genetic elements from certain viruses that enhance expression of cancer genes.

The Postdoctoral Research Fellowships for Physicians Program provides three years of support to enable outstanding young physicians to become physician-scientists. To date, through this fellowship program, the Institute is supporting 70 postdoctoral fellows.

Organizations like the Institute and the Minnesota Medical Foundation have made a major investment in the research training of M.D.s and Ph.D.s who will carry forward the revolution in biology.

◆ Undergraduate Science Education

Previous studies have shown that of 340,000 entering college freshman interested in science and engineering, about 135,000 are lost from the science pipeline as undergraduates. Over 200,000 other students, however, graduated with a degree in science and a significant portion of them went on to graduate studies in science and engineering. These and other data suggest that effective undergraduate programs can help attract and retain more students in the sciences.

In response to these analyses, in part, the Institute in 1987 committed $176 million to attract and retain more undergraduates in the biomedical sciences. This has become the largest private initiative ever undertaken in the United States for undergraduate science education. Since then five-year grants have been awarded to 181 institutions to support undergraduate programs in the sciences.

Of the $176 million, approximately $60 million is being used for programs to recruit and retain students in the sciences, including women and members of underrepresented minority groups. The major portion of these funds is for undergraduate research, involving summer and academic-year research in on- and off-campus laboratories. More than 7,600 undergraduate students at institutions around the country, to date, have benefitted from Institute support for laboratory research.

An additional $28 million is being used for science faculty development. Through this program to date, some 114 new faculty members in biology and related sciences have been appointed. Approximately $54 million is earmarked for the development of science curricula, equipment, and laboratories. Another $34 million is supporting precollege and outreach programs for teachers and students, particularly those from groups underrepresented in the sciences.

Approximately 5,400 teachers and about 15,000 students nationally have participated directly in these outreach initiatives. I can best describe our undergraduate program through examples of academic institutions in Minnesota which have received our awards.

The Institute considers providing hands-on undergraduate research experiences essential to attracting and retaining students in the sciences, particularly the biological sciences. Carleton College is an example of an undergraduate institution that received a grant from the Institute to support several components of the undergraduate initiative.

Since the $800,000 grant was made in 1988, Carleton has provided support to about 30 undergraduates for research opportunities with the College's faculty members. Kathy Friedman, one of the first students in the program, subsequently won an Institute Predoctoral Fellowship. She is currently a predoctoral fellow at the University of Washington.

Another major component of the Institute's Undergraduate Program involves faculty development. St. Olaf College received a $600,000 grant from the Institute in 1988, a portion of which is being used to support faculty development. Over the past four years, five faculty members have received stipends from the grant to enable them to conduct their research. Their projects often involve the active participation of undergraduates.

Curricula, laboratories, and equipment also receive consideration as a program component. Macalester College has undertaken a revision of its introductory biology sequence laboratories as well as laboratories for chemistry and physics. With an Institute grant of $800,000 in 1988, the College has developed investigative laboratories in such areas as introductory cellular and molecular biology. Student enrollment has markedly increased, and students seem to enjoy their science experiences more, an important factor in attracting and retaining students in the sciences, particularly at the introductory course level.

Precollege and Outreach Program

The final element of the Undergraduate Biological Sciences Education Program consists of a precollege and outreach component. Institute-supported activities at the University of Minnesota, which received a $1 million grant in 1989, illustrate how precollege and outreach elements can be developed into successful and important program components.

The High School Summer Science Research Experience is a residential program in which 11th grade students spend eight weeks on campus during the summer doing independent research with a faculty mentor. Several students who participated in this program have maintained a strong interest in research.

For example, Marguerite Smith, an African-American, and Priscilla Johnson, a Native American, as high school students were fully supported by the Institute's grant for independent research in the summer of 1990. Each has continued her research in the Institute-funded undergraduate Biology Scholars Program at the University of Minnesota since entering in the fall of 1990.

Other students such as Jose Gomez and Ed Overstreet participated as undergraduates in the neuroscience program at Lake Itasca that is supported by the Institute. Both students are currently in the M.D./Ph.D. program at the University of Minnesota.

The Institute's commitment to undergraduate education continues. The trustees have approved another $81 million over the next three years for a new undergraduate initiative, which will bring the Institute's total undergraduate commitment to $257 million. We are pledged to fostering the kinds of programs so evident here in Minnesota institutions and across the country to attract more students to the sciences, not only for training the next generation of scientists but also for increasing the level of public understanding of science for each succeeding generation of students.

In May of 1991 the Institute announced a precollege science education grants competition for museums. With a major focus on elementary school children, this initiative complements the precollege outreach activities funded by the Institute through the undergraduate science education program, which have been geared primarily to secondary school students and teachers.

In June of this year, the Institute awarded $6.4 million in five-year grants to 29 natural history museums, science

museums, and children's museums to reach a highly diverse audience. With this funding, museums nationwide will play an expanded role in informal science education outside of classroom walls. Of that amount, approximately $2.1 million will go for teachers and curriculum, $1.6 million for children and youth outreach activities, $1.7 million for children and youth museum activities, and $1 million for involvement with families and community groups.

Two Minnesota museums — the Science Museum and the Children's Museum in St. Paul — received grants of $200,000 and $125,000 respectively. The Science Museum's successful proposal, called "Science Pathways-Explorations in the Biosciences," will provide among other activities natural history field trips, camps in which elementary school students can study biology and natural history, a Bioscience Field Institute for Elementary School Teachers, and a project newsletter for student and teacher participants.

The Children's Museum project, called "Water, Ni-bi', H_2O," is a hands-on curriculum for students in the first through sixth grades that connects water exploration with scientific explanations of water and the Ojibway American Indian water stories. The program is intended to reach urban and rural, Indian and non-Indian, students in classrooms across Minnesota. It will help students understand how two communities, Ojibway Indians and scientists, perceive water.

The trustees approved another $4 million for a competition in 1993 involving science museums and related institutions. This competition will also include aquaria, botanical gardens, and zoos.

◆ Science Education for the Next Generation

The Institute's support of precollege programs reflects the importance attached to bolstering education in science, starting with the earliest years of school. Elementary school children are often intrigued by the life sciences. One student when queried about the circulatory systems said, "I forgot whether my veins bring the blood to my heart or take it away. But my veins remember and that's the important thing." Another described genetics as why you look like your father, and if you don't, why you should. A third exclaimed, "I have decided that genes are my eighth favorite thing in the universe!"

As Seth Blackshaw, one of the Institute's predoctoral fellows, observed in his application, the world of science — especially biology and medicine — has never seemed more full of wonder and possibilities. Students at an early age must be exposed to this world. Scientists have a special responsibility to reach out to students.

An example is Dr. Thomas Cech, a Hughes investigator at the University of Colorado, who won the Nobel Prize in 1989 at the age of 42 for his work on RNA. Tom grew up in the Midwest, in Iowa City, Iowa, and recalls discovering science for himself in the fourth grade. As a faculty member at the University of Colorado, he has made a commitment to teach undergraduates and last year began to teach a freshman chemistry course.

I would like to close with the story of Dr. Seuss that Dr. Cech uses in his lecture. In *On Beyond Zebra*, Dr. Seuss tells us of young Conrad Cornelius O'Donald O'Dell, his very young friend who is learning to spell. Mr. O'Dell learned the entire alphabet: "A" is for "ape," "B" is for "bear," ... "R" is for "rat," ... all the way through the 26 letters to "Z" is for "zebra." Mr. O'Dell is very pleased with himself and stops with "Z" — because that is as far as the alphabet goes.

Dr. Seuss, however, has a few things to teach young Mr. O'Dell: "You can stop if you want with 'Z,' because most people stop with 'Z.' But not me. In the places I go there are things that I see that I never could spell if I stopped with the 'Z.' My alphabet starts where your alphabet ends!"

For too many children, their exposure to science never goes beyond "Z" and the doors to the world of science are never fully opened. But Dr. Seuss gives us hope. At the end of the story, he tells us that he took young Mr. O'Dell to many, many places to show him many new wonderful things: "I led him around and I tried hard to show, there are things beyond 'Z' that most people don't know. I took him past 'zebra' as far as I could and I think, perhaps, maybe, I did him some good."

Dr. Seuss's moral as it applies here is that all of us in the world of biology and medicine must do our part to open the doors to young men and women, with special attention to minorities, to show them the extraordinary opportunities in biology and medicine and the unlimited potential to benefit all of humankind.

Through molecular biology we are scaling the spiral staircase of DNA and putting into perspective the crucial role that DNA plays in all living organisms. The Minnesota Medical Foundation and everyone here who has contributed to it, together with the University of Minnesota and other institutions in this state, are all major partners in the great biological venture that is moving us into the 21st century. ■

Breakthrough in Alzheimer's research

Researchers at the University of Minnesota and the University of Washington have discovered that 90 to 95 percent of people with early-onset Alzheimer's disease have a defect in the same area of the same chromosome.

The findings appeared in the October 23 issue of *Science*, the journal of the American Association for the Advancement of Science.

Dr. Leonard Heston, former University of Minnesota professor of psychiatry and one of 13 collaborators on the project, said researchers are honing in on the precise genes that are malfunctioning and what they do. Scientists should then be able to develop a way to prevent early-onset Alzheimer's from developing, possibly by bypassing the defective gene.

Using so-called genetic markers, the researchers found that almost all the people with early-onset Alzheimer's had a defect at the same site on the 14th chromosome, one of the 26 chromosomes in all human cells.

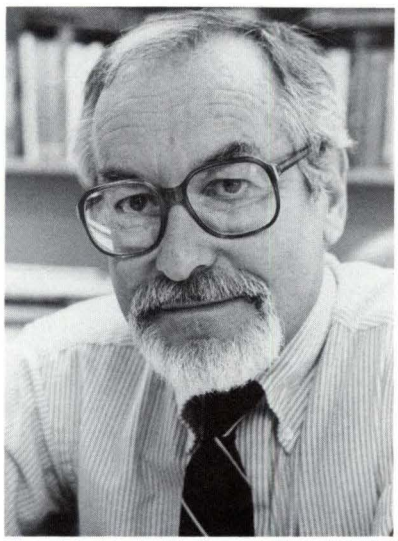
About 20 percent of the 4 million Alzheimer's patients in the United States have early-onset, defined as beginning before age 65.

Co-authors with the University of Washington researchers, including Heston, are ***Drs. Harry Orr***, professor of laboratory medicine, and ***June White***, senior scientist in the Department of Psychiatry, from the University of Minnesota. ■

Blood pressure drugs used for heart attack patients

Two drugs used to treat high blood pressure can help prevent future heart attacks, prolong survival in heart attack patients, and reduce the incidence of heart failure, according to studies by researchers at the University of Minnesota and the Mayo Clinic.

The findings were published in the September 3 issue of the *New England Journal of Medicine*.



Dr. Jay Cohn

The drugs involved in the studies, captopril and enalapril, control blood pressure by interfering with the enzyme system in the body that causes blood vessels to constrict. With heart attack patients, the drugs work by changing the way the heart repairs itself after a heart attack, stopping the enlarging process and enabling the organ to maintain its pumping efficiency.

Dr. Jay Cohn, head of the University's cardiovascular medicine division, was a principal investigator in the enalapril study. ■

Class of 1996 begins studies

The Medical School Class of 1996, consisting of 185 men and women, has begun its four-year course of study on the Twin Cities campus. The class consists of 159 Minnesota residents and 26 non-residents. There were 2,847 initial applicants for positions in the class.

There are 88 women and 97 men in the group. Premedical education includes 52 from the University of Minnesota, five from Minnesota state universities, 55 from Minnesota private colleges, 17 from colleges in surrounding states, 22 from colleges east of the Mississippi, 33 from colleges west of the Mississippi, and one from a foreign country.

One hundred five of the students had a grade point average in college of 3.6 or higher, and 66 had an average between 3.1 and 3.5. ■

Cord-blood transplant at University second in nation

A five-year-old leukemia patient was treated recently at University of Minnesota Hospital with blood taken from his newborn brother's umbilical cord. This is only the second time such a transplant has been done in the United States for leukemia.

Dr. John Wagner, head of the program at the University, reported that the patient was doing well.

The relatively new procedure of using umbilical cord blood instead of bone marrow to treat cancer and blood diseases appears to reduce the risk that transplanted tissue will be rejected by the patient. Similar to a bone marrow transplant, the patient receives the blood through a transfusion rather than a surgical procedure. ■

DEPARTMENTAL UPDATES

Dermatology

Dr. Peter J. Lynch, professor and head of the department, has been named president-elect of the Association of Professors of Dermatology. ***Dr. Mark Dahl***, professor, assumes the presidency of the American Academy of Dermatology on December 10, 1992. ***Dr. Janellen Smith***, clinical assistant professor, is secretary of the National Association of VA Dermatologists and a member of the Task Force on Dermatologic Oncology, American Academy of Dermatology. ***Dr. Christopher Zachary***, assistant professor and director of the Cutaneous Surgery Center, is involved in a study of immunoenzyme assisted Mohs micrographic surgery for complex skin cancer recognition and removal.

Family Practice & Community Health

New faculty since September include ***Dr. Joel P. Jahraus***, assistant professor and assistant unit director, Methodist Unit; ***Dr. Malcolm McDonald***, assistant professor and assistant unit director, St. Joseph's Unit; ***Dr. Earl J. Peterson***, assistant professor; ***Dr. Richard L. Reed***, associate professor and coordinator, Geriatrics Program; and ***Dr. James S. VanVooren***, assistant professor and associate unit director, University Unit.

Medicine

Dr. Jack Oppenheimer, professor and director of the Division of Endocrinology, has received the 1992 Distinguished Service Award from the American Thyroid Association. ***Dr. Carl White***, professor and director of clinical cardiology, has been voted president-elect of the Minnesota affiliate of the American Heart Association.

Obstetrics & Gynecology

The Beim Family Foundation has contributed $5,000 to support ***Dr. Linda Hammer-Burns'*** cancer patient quality-of-life study, which is looking at how women with reproductive cancers psychologically cope with the disease and treatment. ***Dr. June LaValleur*** was appointed to the advisory board of the Midlife Women's Network, a newsletter to empower and inform women during the midlife years. ***Dr. Linda Carson*** has been named permanent division director of Gynecologic Oncology. She also won the debate on secondary cytoreduction in ovarian cancer at the GOG Ovarian Cancer Salvage Conference in July. ***Dr. Jacques Stassart*** has been named interim division director of Reproductive Endocrinology and Infertility. ***Dr. Edward Maeder, Jr.*** has been elected chairman of District VI of The American College of Obstetricians and Gynecologists. ***Dr. Marianne Mason*** has joined the department as an assistant professor in the newly formed division of Benign Gynecology.

Pediatrics

Dr. Albert Rocchini has received $44,000 from the Emma B. Howe Foundation to establish a preventive cardiology clinic for children and adolescents. ***Dr. Emmanuel Katsanis*** received the Young Investigator Award from the American Society of Pediatric Hematology/Oncology. ***Dr. James Moller*** was named president-elect of the American Heart Association. ***Dr. Paul Quie***, American Legion heart research professor, received the 1992 Physician Communicator Award from the Minnesota Medical Association. ***Dr. Scott Giebink***, professor of pediatrics in infectious diseases, was appointed associate head of the department.

Pharmacology

Drs. H. Loh and ***A. Takemori*** have become Charter Fellows of the College on Problems of Drug Dependence. The Junior Faculty Award from the American Cancer Society was given to ***Dr. L.M. Nutter. Dr. A.J. Quebbemann*** was elected honorary member of Phi Chi, the medical student fraternity. ***Dr. W. Gibson Wood*** will be part of the NIH/NIAAA Biochemistry, Physiology, and Medicine study section for 1992-1996. ***Dr. P. Sammak*** has joined the department as an assistant professor and will focus his research on the signalling and the physiology of endothelial cells.

Physical Medicine & Rehabilitation

Corinne Ellingham has been named vice president for education, American Physical Therapy Association. ***Cheryl Meyers*** has been elected a board member of the Minnesota Occupational Therapy Association. ***Judith Reisman*** has been named to the Roster of Fellows, American Occupational Therapy Association. ***Marilyn Weber*** joined the department in July. ***Dennis Dykstra*** was named department head in August.

Physiology

Dr. Hon Cheung Lee received an NIH grant for "Calcium Regulation Systems in Sea Urchin Eggs." ***Dr. Apostolos Georgopoulos*** received an NSF grant for "Information Processing in Motor Behavior." ***Dr. Kevin Fox*** received an NIH grant for "The Role of NMDA Receptors in Cortical Plasticity." ***Dr. Robert Miller*** was elected to the presidency of the Association of Neuroscience Departments and Programs.

Radiology

Deborah Day, associate professor, has been named a Fellow of the American College of Radiology.

Surgery

Dr. John Najarian, chief of surgery, recently was named president-elect of the International Transplantation Society. His two-year term will begin in 1994.

Therapeutic Radiology

Dr. Seymour H. Levitt, professor and head of the department, will be made an honorary member of the Deutschen Rontgengongress in Wiesbaden, Germany, in May of 1993. ***Dr. Elizabeth Auger*** is a new assistant professor in radiobiology.

Urologic Surgery

Dr. Jon L. Pryor, assistant professor, received a five-year NIH Clinical Investigator Award for $325,000 for his project entitled "Characterization of Human Sperm and Epididymal Antigens." He used a powerful technique of neonatal tolerization to produce monoclonal antibodies to human epididymal antigens. He will use these antibodies as probes for biochemical, molecular, and clinical studies of sperm proteins and glycoproteins.

School of Public Health

Dr. Stephen C. Joseph, dean of the School of Public Health, has been named national director of the newly-formed Child Health Initiative. The purpose of the program is to create health care services that are responsive to children's needs. ***Dr. Henry Blackburn***, epidemiology professor, has received the Pioneer Award from the Minnesota Department of Health for longstanding and significant contributions to disease prevention and health promotion in Minnesota.

UMD School of Medicine

Dr. Ronald Franks, dean of the University of Minnesota, Duluth (UMD) School of Medicine, has been selected to serve as a higher learning representative on the Minnesota Rural Health Advisory Committee. The 15-member committee will advise the Minnesota Health Care Commission on rural health issues. ■

MMF approves $95,385 in research grants

The Minnesota Medical Foundation board of trustees approved $95,385 in research and special grants at its summer quarterly meeting. The amount includes $60,510 in faculty research grants, $24,975 in special grants for research equipment and salary support, and $9,900 in student research grants.

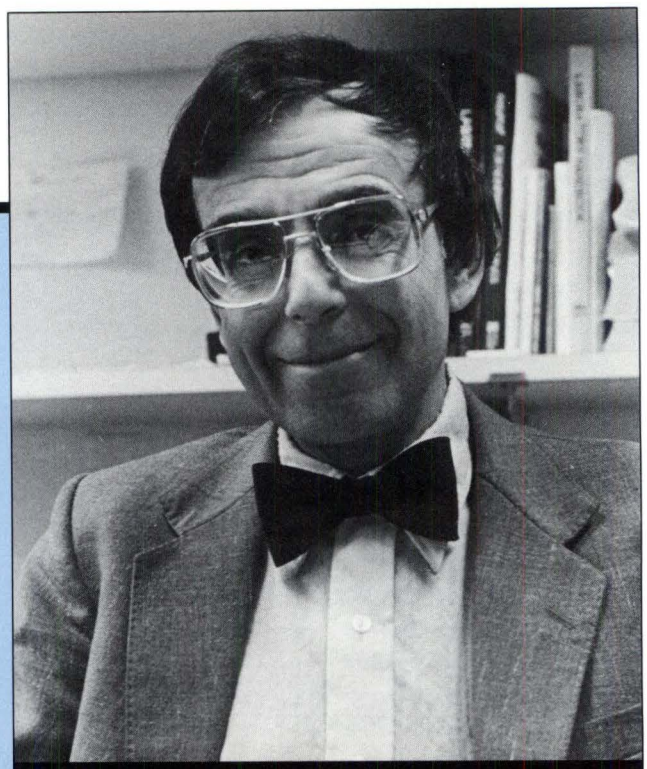
FACULTY GRANTS include: ***Jose Barbosa, M.D.***, Medicine, $3,000, Genetic, metabolic, and physiologic studies of vessel disease in diabetic families; ***Arthur L.Caplan, Ph.D.***, Center for Biomedical Ethics, $1,500, Analysis of genetic counseling clinic visit information sheets; ***Elke Eckert, M.D.***, Psychiatry, $3,000, Mechanisms of immune dysfunction in anorexia nervosa; ***Helen Enright, M.D.***, Medicine, $7,000, Chromatin structure and DNA susceptibility to oxidant damage; ***Alfred J. Fish, M.D.***, Pediatrics, $3,000, Kidney cell integrins; ***Christopher M. Gomez, M.D., Ph.D.***, Neurology, $3,410, Mutant receptors as a potential cause of excitatory neurotoxicity and neurodegenerative disease; ***Sergei A. Grando, M.D., Ph.D.***, Dermatology, $7,000, Keratinocyte cholinergic system; ***Deepak A. Kapoor, M.D.***, Urologic Surgery, $4,000, Generation of immunotoxins against human bladder cancer; ***Carol Anne Olson, M.D., Ph.D.***, Medicine, $4,000, The role of viremia in the pathogenesis of cytomegalovirus disease; ***Paul J. Orchard, M.D.***, Pediatrics, $3,000, Determination of the frequency of retroviral transduction in murine lymphocytes utilizing the Thy 1.1 gene; ***Daniel P. Romero, Ph.D.***, Pharmacology, $6,000, Structural and functional analysis of telomerase RNAs; ***Sabita Roy, Ph.D.***, Surgery, $6,000, Effects of morphine on macrophage colony formation; ***Sara J. Shumway, M.D.***, Surgery, $5,500, Metabolism of muscle stimulated for cardiac assistance; ***Donald Simone, Ph.D.***, Psychiatry, $1,600, Excitatory amino acid receptors and hyperalgesia; and ***C. Gail Summers, M.D.***, Ophthalmology, $2,500, Experimental studies of extraocular muscle scarring.

SPECIAL GRANTS include: ***Angeliki Georgopoulos, M.D.***, Medicine, $6,000, Insulin dependent diabetes—effects of two diets on fasting and postprandial lipoprotein metabolism; ***Donald A. Simone, Ph.D.***, Psychiatry, $6,000, Excitatory amino acid receptors and hyperalgesia; and ***John C. Winkelmann, M.D.***, Medicine, $12,975, Beckman J2-HS centrifuge.

STUDENT GRANTS include: ***Jaroslaw M. Ambroziak***, Effect of advanced age on the function of human memory and naive T cells; ***Jacalyn A. Dahl***, The

(continued bottom Page 24)

MMF Grant Recipient: Dr. Jose Barbosa



DR. JOSE BARBOSA

Jose Barbosa, M.D., professor in the Department of Medicine, was one of 18 faculty members to receive a grant at the Minnesota Medical Foundation's summer meeting of the board of trustees. In all, the MMF board approved $95,385 in faculty research grants, student research grants, and special grants (see adjacent article).

Barbosa received $3,000 from the Minnesota Medical Foundation in support of his project titled "Genetic, Metabolic, and Physiologic Studies of Vessel Disease in Diabetic Families."

"Diabetic kidney disease," says Barbosa, "although affecting only about 40 percent of diabetics, is one of the main causes of death in these patients. It is also one of the main causes of renal disease in the United States. To explain the apparent unpredictability of this complication in diabetics, we have theorized that genetic susceptibility is a major factor and have shown that diabetics with siblings affected by both diabetes and kidney disease are much more likely to also suffer from kidney disease than diabetics with siblings affected by diabetes without kidney disease.

"Since these results could be due to familial factors other than genetic ones," Barbosa explains, "we initiated a prospective study of diabetic families with two diabetic siblings approximately two years ago. These families are studied periodically for all factors thought to be potentially involved in diabetic renal disease. In addition, the affected diabetic sibling pairs undergo a needle kidney biopsy at baseline. Morphologic changes, especially mesangial expansion measured by electron microscopy, are the most sensitive markers of early renal disease and consistently predict early renal failure."

Barbosa says that recent results have shown that the degree of concordance for mesangial expansion within the affected sibling pairs is very high, supporting the hypothesis that genetic susceptibility factors influence renal disease in diabetics.

To broaden the scope of the study, Barbosa and colleagues have theorized that diabetic vessel disease in general is also influenced by genetic susceptibility, and they have added to their prospective studies assessment of vascular compliance, molecular studies of several candidate genes possibly involved in vessel disease or hypertension, and studies of insulin resistance obtained through a combined intravenous glucose and tolbutamide test.

"These studies," says Barbosa, "may define predictors of vessel disease, kidney disease, and diabetes. In addition, they are likely to enhance our knowledge of the natural history of diabetic vascular disease in general and renal disease in particular in diabetic families." He explains that this knowledge could lead to more effective, earlier treatment for individuals with the highest susceptibility.

According to Barbosa, the prospective study needs to continue for at least three more years, at which time the renal biopsy will be repeated. The grant from MMF will provide interim support for continuation of the project, which has been submitted to the National Institutes of Health (NIH) for major funding.

Jose Barbosa has been on the faculty of the Department of Medicine since 1975. His primary research interests involve the immunogenetics of diabetes and diabetes complications. ■

(Continued from page 23)

role of intrinsic balancing in the functional restoration of the tetraplegic hand; ***Paul Jacobson***, Does Type IX Collagen inhibit the formation of cartilaginour matrix in an in-vitro articular cartilage model?; ***Beth A. Judge***, The mechanism of hemoglobin-driven bacterial infections; ***Janet L. Larson***, Purification of tissue factor in plasma; ***Neil Skemp***, Detection of minimal residual disease in acute promyelocytic leukemia; and ***Anil Kumar Tadavarthy***, Is tissue factor procoagulant activity differentially stimulated in peripheral blood monocytes by bacterial lipopolysaccharide when compared to Lipid A? ■

MMF Golf Classic a success

The 2nd Annual Minnesota Medical Foundation Golf Classic was held August 31 at Hazeltine National Golf Club in Chaska. More than 200 golfers — Medical School alumni, faculty, donors, and friends — enjoyed the challenging course and the festive dinner and awards program that followed.

The MMF Golf Classic raises funds to support medical research at the University of Minnesota Medical Schools. This year's event raised $30,000.

Honorary co-chairs of the event were McKinley Boston and Chris Voelz, University of Minnesota men's and women's athletic directors. Co-chairs were Drs. Greg Vercellotti and Tim Walseth. Committee members for the Golf Classic included Dr. Lane Arey, Dr. Ken Bloom, Robert Burgett, Dr. Chuck Daniels, Dr. John Davenport, Bill Flanagan, Chuck Gooder, Dr. Steve Haines, Dr. Dave Kendall, Dr. John LaBree, Dr. June LaValleur, Dr. Tucker LeBien, Mark Marshall, Dr. Scott Nyberg, Antoni Potami, Dr. Paul Quie, Pam Reimer, Dr. Ralph Shapiro, Dr. Lee Sabath, Barb Streets, David Teslow, and Dr. Jim White.

Major sponsors of the event were Medtronic, Inc., Alliance Capital, Radisson Hotel-Metrodome, Downtown Pontiac-Jaguar, Glaxo, and Lederle Oncology.

Hole and special event sponsors included First Asset Management, Abbott Laboratories, Amgen, Baxter-Hyland Division, Caremark, Pfizer, Inc., Ciba-Geigy, Critical Care America Corporation, Genentech, IDS Advisory Group, KPMG Peat Marwick, Lederle, McNeil Pharmaceuticals, Miles Pharmaceutical, U.S. Surgical Auto-Suture, Sparboe Companies, Carlson Travel Network-U of M, Immunex, Rainbow Signs, and Miles Biological-Cutter Division.

Other sponsors included Beckman Instruments, Hodapp Surgical Supply, Kirke-Van Orsdel, Minneapolis Floral, Pharmacia Deltec, Quantum Health Resources, Schering, and Smith-Kline Beecham.

Additional prizes and gifts were provided by Baxter-Hyland, Best Buy Company, Byerly's, Inc., Cafe Solo, Cafe Un Deux Trois, Clintec, Critical Care America, D'Amico Cucina, Dougherty Dawkins, Goodfellow's Restaurant, Gulf Beach Resort-Hotel, J.D. Hoyt's, Hyatt Hotel-Minneapolis, Impra, Inc., Immunex, Ivories Restaurant, Lund's Food Stores and Patricia Lund, Marquette Banks-Stadium Village, Miles Pharmaceutical, Novo Nordus, Dr. Scott Nyberg, Octagon Financial Group, Old Log Dinner Theater, Pharmacia Deltec, Sandoz, Sanofi Diagnostics Pasteur, Sanofi Winthrop, Teltech, University of Minnesota Men's Athletics, University of Minnesota-Trademark Licensing Office, and Wally McCarthy Oldsmobile. ■

Golfers at the MMF Golf Classic at Hazeltine National Golf Club prepare to start play.

Participants in the MMF Golf Classic enjoyed their day at Hazeltine National Golf Club.

Parents' Day at Medical School

Approximately 150 parents of first-year medical students learned what Medical School is all about at the seventeenth annual Parents' Day, held October 24 on the Twin Cities campus.

The day-long program included welcoming remarks by Rachael Bye, president of the Medical Student Council; David Johnson, vice president/programs at MMF; and Dr. David Brown, dean of the Medical School. Dr. Donald Robertson, assistant dean for admissions, spoke to the parents about the selection and makeup of the Class of 1996, and Dr. Robert McCollister, associate dean for curriculum affairs, explained the Medical School curriculum.

Dr. Helene Horwitz, assistant dean for student affairs, talked about the hopes, dreams, and concerns of prospective physicians, and freshman class president David Olson gave a student's perspective on the first few months of Medical School.

Parents' Day also included tours of the Medical School and the hospital, lunch at the Outside Inn cafeteria in the Phillips-Wangensteen building, and a reception at the conclusion of the day at the Bridges cafeteria in the hospital.

Parents' Day is sponsored by the Minnesota Medical Foundation and the Medical Student Council. ■

Coca-Cola supports Ataxia Center

The Bob Allison Ataxia Research Center at the University of Minnesota Medical School got some help recently from the Midwest Coca-Cola Bottling Company. At a recent promotion, Cub Foods stores in Coon Rapids and Minnetonka donated a portion of the sale of Coke products to the Center.

The first check of $9,000 was presented in September at the Coon Rapids store, with a second check, for $7,850, following in October.

Bob Allison, former Minnesota Twin and Coca-Cola employee, suffers from ataxia, a group of neurological diseases associated with dysfunction of the cerebellum.

For more information about the Bob Allison Ataxia Research Center, contact Robert Burgett at the Minnesota Medical Foundation, (612) 625-0972. ■

Receiving a check from Coca-Cola are Paul Lauer from Coca-Cola, Arne Haug, Cub Foods–Coon Rapids, David Teslow, MMF president, Betty Allison, Bob Allison, Jim Junkert, Dick Lindeen, Cub Foods–Coon Rapids, Mark Allison, and Frank Quilici.

University of Minnesota Cancer Center

Pledges and gifts totaling $27.3 million have been received in support of the Fund for the University of Minnesota Cancer Center. Proceeds from the $30 million campaign will be used to: build a 78,000-square-foot research facility that will provide laboratory, seminar, and office space; establish at least eight endowed chairs to attract leading cancer experts to supplement an outstanding group of researchers; and provide funding for new research programs and expansion of existing programs. Construction of the new facility will begin in March of 1993, with completion planned for the spring of 1995. ■

Women's Health Fund

Progress continues to be made in raising $1 million for an endowed chair in women's cancer research. To date, close to $300,000 has been raised, and the gyn-oncology faculty have committed matching funds up to $250,000. When funded, this chair will ensure permanent support for ongoing research programs in women's reproductive cancers. For more information, contact Lynn Slifer at (612) 626-2612.

For the past year, an advisory committee has been meeting regularly to generate plans for support of the programs of the Department of Obstetrics and Gynecology. This past fall, the group officially approved by-laws and became the board of the Women's Health Fund at the University of Minnesota. The mission of the Women's Health Fund is to promote and contribute to the programs, projects, and research of the Department of Obstetrics and Gynecology.

The Department of Obstetrics and Gynecology Alumni and Friends Society sponsored a reception following the annual Fall Symposium session on October 22. About 40 physicians, residents, nurses, and other health professionals attended the event, the first in a series of receptions being sponsored by the Society. ■

University Children's Foundation

The Children's Kidney Disease Society (CKDS) held its annual benefit October 26 and announced a pledge of $25,000 to begin funding of the Robert L. Vernier Endowment in Pediatric Nephrology. A check for $5,000 was presented to Dr. Vernier by CKDS President Betty Olafsen.

Dr. Thomas and Audrey Votel, Tom and Barbara Votel, Michael and Jeanne Bazal, and Gene and Joan Dorsa hosted a benefit on October 16 which raised over $17,000 for an endowed chair in children's lung diseases.

The Upper Midwest Immunology Network has been formed to raise funds and conduct support programs for patients with primary and secondary immune deficiency. For more information, contact Cynthia Livingston at (612) 626-1904.

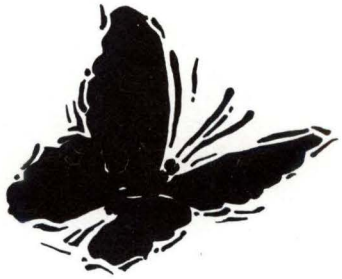
Dr. Chester B. Whitley received a grant of nearly $150,000 from Ronald McDonald Children's Charities to support his research in the molecular genetics of MPS diseases. Dr. Albert Rocchini received more than $40,000 from the Emma B. Howe Memorial Foundation to start a Preventive Pediatric Cardiology Clinic. ■

Vision Foundation

The annual Thanksgiving for Vision Celebration was held October 3 at the Hyatt Regency Hotel in Minneapolis. The event is held "To celebrate restored vision; To recognize the fear, commitment, hope, struggle, and joy experienced as an eye patient; To recognize contributors for their support of the Minnesota Lions Eye Bank and the Department of Ophthalmology; To acknowledge faculty and staff commitment; and To appreciate volunteers."

Master of Ceremonies was Roger Ledding of the Minnesota Department of Transportation. Speakers included University of Minnesota President Nils Hasselmo, Vision Foundation President Dick Grayson, Minnesota Lions Eye Bank Medical Director Dr. Donald J. Doughman, and corneal transplant recipient Kelly McDonald. Vaughn Bien, board chairman of the Minnesota Lions Eye Bank, received the Vision Foundation Outstanding Service Award. ■

Children's Cancer Research Fund



The Minneapolis Marriott Hotel was the site for the Children's Cancer Research Fund (CCRF) annual fall benefit, called "The Dream Ball." Held on November 21, the dinner/dance featured music by Rupert's orchestra, a silent auction, and a cameo appearance by the Coasters. The Dream Ball and other CCRF events held throughout the year have helped raise millions of dollars for pediatric oncology research at the University of Minnesota. ■

Variety Club Association

Variety Club will host "Breakfast with Santa" December 18 for patients of Variety Club Children's Hospital and their families. The festive event gives the children a welcome break from medical routines and treatments.

The eighth annual Steve Payne/Snyder Golf Tournament, held June 8, was a tremendous success, doubling last year's fund-raising efforts. Thanks to Don Beeler, CEO of Snyder Drug Stores; Steve Payne, former North Star hockey player and local businessman; and the many volunteers who helped with this event.

Everyone had a wonderful time at Como Zoo June 5 at Variety Club's annual Zoo Party. More than 200 children from Variety Club Children's Hospital, Variety Club Children's Clinic, and other organizations and agencies enjoyed the fun-filled day.

The annual Toyland Auction and Dinner, held November 7, was a great success. The evening featured a silent auction, a live auction with guest auctioneer Dr. Harold Panuska, and comic entertainment by John Bush.

Variety Club's April 24, 1993, Affair of the Heart will honor N. Larry Bentson as Humanitarian of the Year. Bentson is a long-time member and supporter of Variety Club.

Paul Ayotte, Variety Club member, was recently awarded the Presidential Citation at the Variety Clubs International Convention. Another Variety Club member, Betty Ratner, was recently named one of two finalists for the J.C. Penney "Outstanding Volunteer of the Year Award." ■

MAS NEWS

President's Report

So many things are occurring with the Medical Alumni Society that this year promises to be an exciting one for new projects and events. I hope you will want to be a part of all this and consider joining the University of Minnesota Alumni Association. You can find out how to join by contacting the alumni office at the Minnesota Medical Foundation.

One of the special projects you may wish to be involved in is the Residents Away From Home program. This program helps ease medical students' expenses while visiting residencies sites around the country. There are two ways to participate.

The first is to open your home, allowing a student to stay with you while visiting prospective residency sites. This allows students to visit the sites of their choice while reducing their costs. However, perhaps the greatest benefit is the opportunity to visit with and share your experiences with a student who is considering a residency near you.

Another option, for those who are unable to host a student, is to serve as a resource, answering questions either by telephone or in person while the student is visiting. Please consider being part of this program. To do so, simply return the reply card from the back of the Medical Bulletin and indicate your willingness to participate.

Your suggestions and comments to the Medical Alumni Society are always appreciated. Anyone who is interested is welcome to serve on one of the many MAS sub-committees and can inquire by calling (612) 625-8676. We hope the reunion classes of 1933, 1938, 1943, 1948, 1953, 1958, 1963, 1968, 1973, and 1983 mark their calendars for June 3-5, 1993, to celebrate their reunions!

Sincerely,

Richard K. Simmons, M.D. '55
President
Medical Alumni Society

Fall Half-Century Club meeting held

On October 21 nearly 20 members of the Half-Century Club — those graduates who have celebrated 50 or more years since graduation — gathered for the first fall luncheon. The Half-Century Club was formed in 1988 as part of the Reunion Weekend celebration with the goal of providing those graduates who have reached this landmark an opportunity to enjoy the camaraderie of classmates and longtime friends.

The Half-Century Club members enjoyed lunch at the Campus Club and a short program. Dr. Leonard Wilson, chairman of the History of Medicine Department, gave a presentation on the fight against tuberculosis in Minnesota. The topic proved of particular interest to the group since many alumni had personal experience with the disease and the struggle against it.

Overall, the day provided a great opportunity to socialize and visit with fellow alumni. Because of the enthusiastic response, another luncheon is being planned for late March. Further details will be forthcoming. ■

ALUMNI CALENDAR

January 29
Alumni Reception,
Seattle, Washington

January 30 - February 7
Alumni Receptions -
California

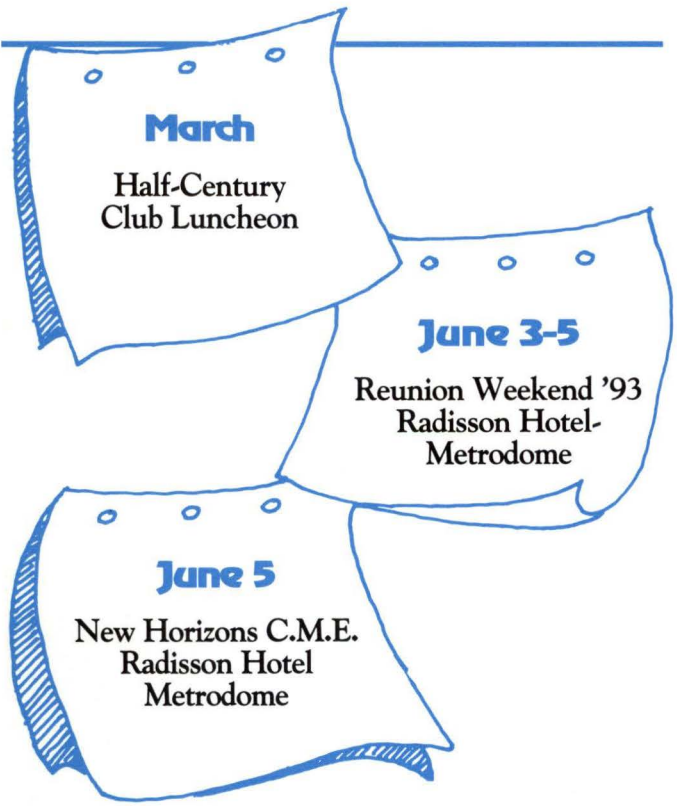
New MAS board members

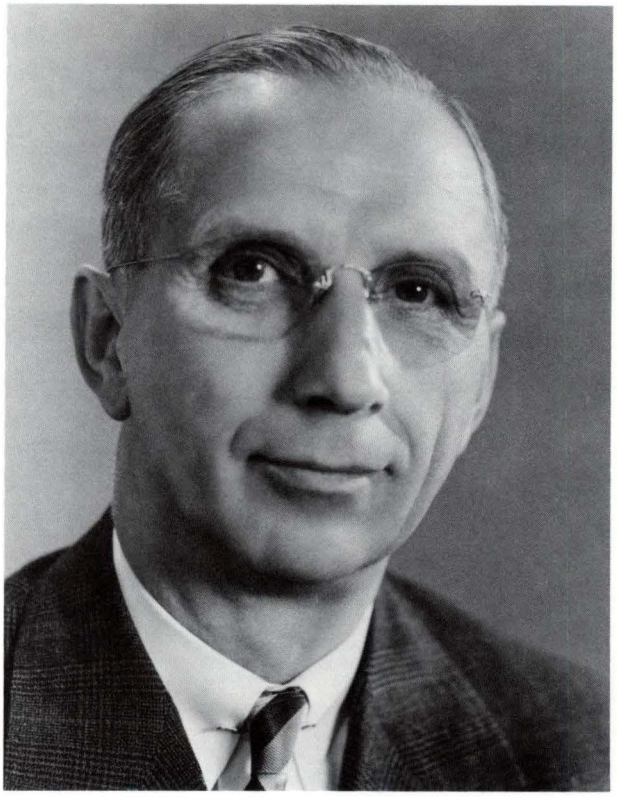
H. ***Mead Cavert, M.D.***, '50, recently retired after many long years of service to the University of Minnesota Medical School. However, he will undoubtedly remain very active in the medical community and brings tremendous insight to the MAS board.

Dave Kendall, M.D., '88, is a Fellow in the Department of Endocrinology at the University of Minnesota. He spent the previous year as the chief resident at the University of Minnesota.

Judith R. Smith, M.D., '66, is completing a delayed Family Practice residency at the University of Minnesota. Her many years of community involvement will be a welcome addition to the MAS board.

Leonard Warren, M.D., '83, is a family practitioner from Lakeville, Minnesota. He spent his first two years of medical school at the University of Minnesota, Duluth. ■





Dr. Harold S. Diehl

Diehl Award nominations invited

D***orothy J. Horns, M.D.***, '76, invites nominations for the Harold S. Diehl Award. The award will be presented at the Medical Alumni Society's Annual Reunion Weekend June 3-5, 1993.

Given in honor of the University of Minnesota Medical School's fifth dean, ***Harold Sheely Diehl, M.D.***, the award is presented to an individual who has made outstanding professional contributions throughout his or her career. The Diehl Award has been presented to 64 people since its inception in 1962.

Qualifications for nomination are:

1. Preferably a graduate of the University of Minnesota Medical School;
2. Not currently engaged in an academic capacity;
3. Outstanding contributions to the Medical School, the University, the alumni, and the community; and
4. Relatively long experience in the field of medical service or a related field.

Nominations should be received by April 9, 1993, and should be sent to: Dorothy J. Horns, M.D., Chairperson, Harold S. Diehl Award Committee, Box 193 UMHC, Minneapolis, MN 55455.

Nominations should include supporting documents and references to assist the committee in its deliberations. Questions may be referred to the Medical Alumni Society at the Minnesota Medical Foundation, (612) 625-8676. ■

CLASS NOTES

1943

Dr. Forrest H. Adams, Rancho Santa Fe, California, chairman of the California Public Employees' Retirement System's Health Benefits Advisory Committee, organized a three-day national conference in 1991 on "Designing a Fair and Reasonable Basic Benefit Plan Using Clinical Guidelines." The transactions were published in 1992 and can be obtained free of charge from Cal PERS at P.O. Box 942719, Sacramento, CA 94229-2719.

1946

Dr. Sheldon L. Mandel, Minneapolis, was elected a Fellow of The Royal Society of Medicine, Section of Dermatology, on July 7, 1992.

Dr. Alvin L. Schultz, Minneapolis, is the recipient of the 1992 "Shotwell Award," a copy of the Paul Granlund bronze sculpture "Sprites." The award is given annually for noteworthy dedicated service to mankind, significant contributions in the field of medicine, or important innovations or improvements in the delivery of health care. Dr. Schultz is senior vice president and chief operating officer of the Medical Affairs Division of Health One Corporation.

1963

Dr. Roger J. Jackman, Palo Alto, California, has been named a fellow of the American College of Radiology. Fellowships in the College are awarded to members for significant scientific or clinical research in the field of radiology or significant contributions to its literature.

1964

Dr. Robert H. Richardson is a visiting scholar at the Center for Medical Ethics, University of Pittsburgh, from September 1992 to August 1993.

1978

Dr. Carmen Nevarez, Oakland, California, was selected to be one of the charter year scholars for the Public Health Leadership Institute sponsored by the Centers for Disease Control (CDC). She was also appointed to the position of director of the Health and Human Services Department, Berkeley.

1981

Dr. Bruce A. Orkin was appointed program director of the Residency in Surgery at the George Washington University Medical Center in Washington D.C. in March of 1992.

1983

Dr. Napoleon Knight, Champaign, Illinois, has been appointed medical director of the Carle Emergency Medical Services System, Carle Foundation Hospital, Urbana.

1985

Dr. Donald Northfelt, San Anselmo, California, is attending oncologist at California-Pacific Medical Center in San Francisco and assistant clinical professor of medicine in the AIDS-oncology clinic at the University of California, San Francisco.

Dr. Kathleen M. Seibel, Durham, North Carolina, is medical director of the Wake County mental health services.

1988

Dr. Pamela Jensen Bundy, Port Angeles, Washington, has taken a position as anesthesiologist at Olympic Memorial Hospital, Port Washington. Dr. Charles Bundy, Class of 1985, is a general surgeon at the same hospital.

1990

Dr. Michael Walker, Santa Monica, California, was awarded a National Research Service Award and an American Cancer Society grant for 1992-93.

IN MEMORIAM

JOHN H. BEGGS, M.D.,
Class of 1957, died February 19 in Lake City, Florida. Dr. Beggs was a surgeon and chief of staff at the Lake City VA Medical Center. He is survived by Mildred Beggs of Lake City.

DONALD C. BELL, M.D.,
Class of 1953, died in September at age 65. An Edina, Minnesota, resident, Dr. Bell is survived by his wife, Joann, four children, and five grandchildren.

THOMAS P. CANNON, M.D.,
Class of 1951, a San Diego, California, resident, died in September. He practiced internal medicine in San Diego for 35 years. Dr. Cannon is survived by his wife, Patricia, eight children, and five grandchildren.

CHARLES F. CERVENKA, M.D.,
Class of 1926, died in October at age 88. A New Prague, Minnesota, resident, Dr. Cervenka is survived by his wife, Ruth, four children, and 18 grandchildren.

ROBERT DYAR, M.D.,
Class of 1934, died July 25 at age 83. A longtime resident of Sonoma, California, Dr. Dyar served as chief of the Division of Preventative Medicine and the Division of Research for the California State Department of Public Health from 1938 to 1968 and dean of the Graduate School of Medical Science at UOP Medical Center, San Francisco. He is survived by three sisters.

DAVID W. MOLANDER, M.D.,
Class of 1946, retired physician from Chatham, Massachusetts, died July 31 at age 69. Dr. Molander was nominated for a Nobel Prize in medicine in the 1950s for his research in liver disease. He helped develop modern chemotherapy treatments, and edited three benchmark texts on Hodgkins disease and diseases of the lymphatic system. Dr. Molander was on the staffs of New York Hospital and Memorial Sloan Kettering Cancer Center in Manhatten, and was a clinical professor of medicine at Cornell University. He had received awards from the governments of the Dominican Republic, Brazil, and Venezuela for his work with cancer patients. Dr. Molander is survived by his wife, Marian, six children, and two grandchildren.

HARVEY NELSON, M.D.,
Class of 1924, longtime Minneapolis surgeon, died August 29 at his Deerfield Beach, Florida, home at age 93. Formerly of Edina, Minnesota, Dr. Nelson practiced from 1925 to 1966. He was chief surgeon for the Soo Line Railroad from 1951 to 1964, was president and founder of the Minnesota Surgical Society, and was a fellow of the American College of Surgeons and American Association of Industrial Surgeons and Physicians. He was also a former president of the University of Minnesota Alumni Association. Dr. Nelson is survived by three grandchildren.

E. IRVINE PARSON, M.D.,
Class of 1937, of Duluth, Minnesota, died September 8 at age 81. Dr. Parson was former chief of staff at St. Luke's Hospital and co-founder of its emergency service. He served as a physician with the Fifth Armored Division in World War II. Dr. Parson was active in the Duluth community and was past president of the St. Louis County Medical Society. He is survived by his wife, Jeanne, four children, and five grandchildren.

ANN WEST ROBINSON, M.D.,
Class of 1925, died July 15 at age 89. She worked as an industrial physician at an atomic energy processing plant in Oak Ridge, Tennessee, from 1944 to 1957, and then joined the medical staff of Molly Stark Hospital, Canton, Ohio. She served as medical director of the Molly Stark Hospital in the 1970s, and was on the clinical faculty of Northeastern Ohio Medical School. Dr. Robinson was active in alcohol and drug rehabilitation, which she pursued until her retirement in 1986. The Drug and Alcohol Rehabilitation wing of Molly Stark Hospital was named Robinson Hall on her 80th birthday. Dr. Robinson is survived by her husband, Lawrence, sister, five children, eight grandchildren, and 10 great-grandchildren.

ELMER M. RUSTEN, M.D.,
Class of 1928, of Plymouth, Minnesota, died September 15 at age 89. Dr. Rusten practiced dermatology and allergy in Minneapolis from 1933 to 1982. He is survived by his wife, Helen, one son, and two grandchildren.

V. DUANE THYSELL, M.D.,
Class of 1933, died in October at age 83. A Hawley, Minnesota, resident, he is survived by four children and seven grandchildren.

We have also received notice of the following:

JAY R. OLSEN, M.D.,
Clinical associate professor at the University of Minnesota Medical School, died August 2 at age 66. Dr. Olsen practiced at the Bloomington Lake Clinic from 1957 to 1981, where he was president of the Clinic's board of directors and head of obstetrics and gynecology. In 1987 he joined Aspen Medical Group in Bloomington. Dr. Olsen was past president, chief of surgery, and director of the unwed mother program at the old Lutheran Deaconess Hospital in Minneapolis, and past chief of the Department of Obstetrics and Gynecology at Fairview Southdale Hospital. He is survived by his wife, Christine, and five children. ■

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THANKS FOR GIVING

Dr. John Sanford

by Jean Murray

The profound impact Dr. John Sanford has had on the city of Duluth and the UMD School of Medicine is difficult to measure. He has touched so many people in so many ways: students, faculty members, fellow physicians, and those in the community.

It can be said without hesitation that the UMD School of Medicine has been greatly enriched by his presence.

In May of 1992, Dr. Sanford received the Chancellor's Distinguished Service Award in recognition of his many contributions to medical education. At the presentation ceremony, the reasons for this high honor were detailed:

"John Sanford has been involved in the UMD School of Medicine since its inception. He was a clinical faculty member, helped plan the clinical sciences curriculum, and taught in the anatomy laboratory. He lectured to freshmen classes and began taking first-year students on his clinical rounds when more preceptors were needed at the school. Besides his teaching duties, Dr. Sanford also served as the Centennial Scholarship Fund campaign leader for Northeast Minnesota and since 1980 has been president of the David L. Tilderquist Library and Scholarship Fund.

"Dr. Sanford also has contributed to medicine in the region by serving as president of the St. Louis County Medical Society in 1989, as president of the Minnesota Surgical Society, and president of the Minnesota Chapter of the American College of Surgeons. He also has served on one hospital board, been the chief of medical staff at two, and chief of surgery at all three Duluth hospitals."

In September Dr. Sanford retired from the Duluth Clinic, bringing to a close 40 years of practice in surgical medicine.

In addition to his involvement in the field of health and medicine, Dr. Sanford has faithfully served the Duluth-Superior Symphony Association, the Glen Avon Presbyterian Church, the McCormick Seminary, and the Duluth Depot Program. In 1991, he was named of member of the board of trustees of the Minnesota Medical Foundation.

Despite all his activities, family does not take second place in John Sanford's life. He met his wife, Dr. Julie Moller, while he was a resident and she was an intern at the University of Illinois Hospital. They moved to Duluth in 1957, where their four children were born. Two of the four, Martha and Paul, have followed their parents' footsteps into medicine.

Drs. Julie Moller and John Sanford

Education is valued highly in the family, and both Dr. Sanford and Dr. Moller are deeply appreciative of the support they received from their parents in their quest to become physicians. They are committed to helping other medical students who have financial needs, and have given generously to support scholarships for students at UMD and the Twin Cities Medical School.

The Minnesota Medical Foundation is deeply grateful to Dr. John Sanford for his gifts of time, service, and scholarship support. ■

Minnesota Medical Foundation
Box 193 UMHC, University of Minnesota
Minneapolis, MN 55455
(612) 645-1440

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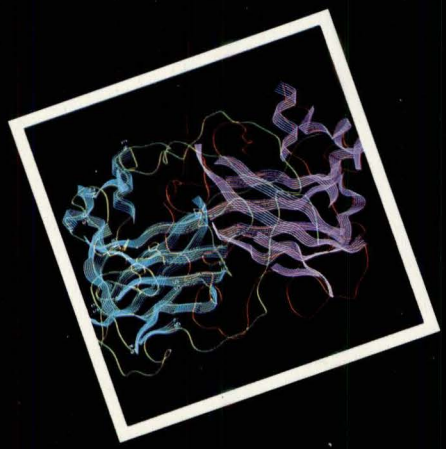

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